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# The Influence of the Family Context and Intervention Implementation Integrity on Child Behavior During Conjoint Behavioral Consultation

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THE INFLUENCE OF THE FAMILY CONTEXT AND INTERVENTION  
IMPLEMENTATION INTEGRITY ON CHILD BEHAVIOR DURING CONJOINT  
BEHAVIORAL CONSULTATION

By

Michelle S. Swanger-Gagné

A DISSERTATION

Presented to the Faculty Of

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In Partial Fulfillment of Requirements

For the Degree of Doctor of Philosophy

Major: Psychological Studies in Education

(School Psychology)

Under the Supervision of Professors Merilee McCurdy and Susan M. Sheridan

Lincoln, Nebraska

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THE INFLUENCE OF THE FAMILY CONTEXT AND HOME INTERVENTION  
IMPLEMENTATION INTEGRITY ON CHILD BEHAVIOR DURING CONJOINT  
BEHAVIORAL CONSULTATION

Michelle S. Swanger-Gagné

University of Nebraska, 2009

Advisors: Merilee McCurdy and Susan M. Sheridan

The purpose of the study was to determine the role of family context variables (i.e., parenting stress and positive parenting practices) as possible moderators and mediators of the relationship between conjoint behavioral consultation (CBC) and change in child problem behavior in the home setting. Another aim of the study was to evaluate the mediator roles of two dimensions of intervention implementation integrity (i.e., adherence to interventions and full engagement in the plan implementation phase) on parenting stress and change in child problem behavior for families involved in CBC. Participants were 203 parents, 81 teachers (81 classrooms), and 203 children who took part in a larger experimental study. Measures included rating scales of parenting stress and parenting practices, home intervention implementation integrity self-reports and permanent products, and parent reports of child problem behavior at home. The presence of moderators and mediators in three models were tested for and teacher effects were accounted for using multilevel path analyses. Results indicated CBC was effective at reducing child problem behavior at home. Additionally, when parent's reported high levels of parenting stress, they reported little increase in their use of positive parenting

practices and less engagement in the CBC plan implementation phase. Furthermore, a parent's full engagement was affected by their child's classroom/teacher. Lastly, as parents reported more adherence to interventions, they reported greater reductions in child problem behaviors at home than when less adherence was reported. Implications for practice and future research directions will be discussed.

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## CHAPTER 1

### Introduction

Childhood behavior problems are predictive of dire outcomes including drug abuse, depression, juvenile delinquency, antisocial behavior, school dropout, and decreased functioning in society (Kauffman, 1997; U.S. Department of Health and Human Services, 2001; Webster-Stratton, 1997). Approximately 15% of children in the United States experience behavioral difficulties. Alarming, this percentage is increasing and behavior concerns are occurring earlier in a child's life (Roberts, Attkisson, & Rosenblatt, 1998; Webster-Stratton, 1997). The U.S. Surgeon General's report on children's mental health stated that "childhood emotional/behavioral concerns are associated with the *most impairment* and no other set of conditions is close in the magnitude of its *deleterious effects* on children and youth" (U.S. Department of Health and Human Services, 2001, p. 21). It is clear that there is a compelling need to investigate and identify effective interventions that reduce behavior problems in multiple settings at an early age.

### *Family Context*

The home setting and family characteristics have a large impact on the development of child behavior problems. For example, parental level of stress, parental psychopathology, marital conflict, parent-child relationships, and parenting practices all predict disruptive behavior problems in children (Frick, 1994; Johnston & Mash, 2001; Webster-Stratton, 1994; Webster-Stratton, 1998). Families experiencing high levels of stress and/or reporting poor parenting skills often are the families characterized as having children with disruptive behavior disorders (Maughan et al., 2005; Patterson, 1982;

Shelton, Frick, & Wootton, 1996; Spratt, Saylor, & Macias, 2007; Webster-Stratton, 1998). Families coping with economic deprivation are also more likely to have children with disruptive and antisocial behaviors (Duncan, Brookes-Gunn, Klebanov, 1994; Reed & Sollie, 1992; Suarez & Baker, 1997). Therefore, researchers (Loeber, 1982; Sanders, Mazzucchelli, & Studman, 2004; Webster-Stratton, 1990; Webster-Stratton, 1993; Webster-Stratton, Reid, & Hammond, 2001) have recommended treating children with disruptive behavior while they are young and involving families in treatment. These recommendations were written into public policy (e.g., No Child Left Behind Act, 2001; IDEA, 1997) and researchers.

Empirically-supported theoretical frameworks have been created to illustrate the notion that children who exhibit disruptive behavior learn this behavior by interacting with multiple environments and systems. As such, an ecological approach focuses on the belief that multiple environments, systems, contexts, and the interactions and experiences occurring within and between systems influence a child's development and behavior at home and school (Bronfenbrenner, 1977). Behavioral theorists have emphasized that a child's behavior is learned while interacting with the environment, and by altering environmental contingencies, a child's behavior can be altered. More specifically, social learning theorists have stressed that children learn from interactions with other individuals and observations of models (Patterson, 1986). Patterson's (1982) behavioral theory of coercion, conceptualizes conduct problems as developed in the home through maladaptive interactions with family members (Patterson, Reid, & Dishion, 1992). Patterson (1982) stated that child rearing or qualities in the parent-child relationship are crucial to a child's development. Together, ecological and behavioral theories suggest

disruptive behavior is learned and such behavior continues because environments, such as the family environment, reinforce the behavior.

### *Empirically Supported Family Interventions*

Fortunately, there are empirically supported models of service delivery that promote partnerships with families and address parenting practices. Evidence based interventions that involve families (e.g., parent behavioral training, Estrada & Pinsof, 1995; Eyberg & Boggs, 1998; Webster-Stratton & Hancock, 1998; conjoint behavioral consultation, Sheridan, Kratochwill & Bergan, 1996) have been shown to be effective at reducing behavior concerns and improving family contexts. Conjoint behavioral consultation (CBC) is an indirect model of service delivery that joins home and school settings in a problem-solving process and implements consistent services across settings. CBC promotes positive parenting practices by providing parents with strategies and skills to address behavioral problems. Present research has demonstrated that CBC leads to positive outcomes for children and maintains promise as an evidence-based model for addressing child concerns through ongoing, collaborative home-school interactions (Guli, 2005; Sheridan, Eagle, Cowan, & Mickelson, 2001).

Despite the abundance of research supporting the effectiveness of CBC at reducing behavior problems (Finn, 2003; Myers, 1997; Wilkinson, 2005), not all children exhibit reduced disruptive behavior after their parents and teachers participate in CBC. Little is known about why these children do not respond to CBC and others respond to CBC. Family context variables such as stress level, parenting practices, parent psychopathology, social support available to the family, and socioeconomic disadvantage have been linked to treatment response of other indirect service delivery models

(Beauchaine, Webster-Stratton, & Reid, 2005; Dumas & Wahler, 1983; Webster-Stratton & Hammond, 1990; Webster-Stratton, 1992).

Researchers have yet to investigate how family context contributes to the reduction of disruptive behavior at home and school during CBC (Illsley & Sladeczek, 2001; Kratochwill, Elliott, Loitz, Sladeczek, & Carlson, 2003). It is important to know the conditions under which behavioral consultation with families and schools is effective (Sheridan & Kratochwill, 2008). Moreover, it is crucial that researchers investigate for whom behavioral consultation is most effective and for whom consultation may require modification. Variables that may impact the relationship between the behavioral consultation process and outcomes for families, schools, and children need to be examined (Sheridan & Kratochwill, 2008). In sum, investigation of behavioral consultation outcomes and the variables that affect outcomes is almost nonexistent. The present study aimed to expand the body of consultation research by examining the possible moderating role of parenting stress and partial mediating role of parenting practices on the relationship between CBC and child problem behavior at home. Additionally, these relationships were evaluated within a multilevel model that accounted for the possible impact of children having similar teachers and/or classrooms.

#### *Treatment Implementation Integrity*

The family context may affect treatment outcomes directly or indirectly by influencing treatment integrity. Context may affect how and if families implement an intervention developed during consultation as designed (Cordray & Pion, 2006; Levensky & O'Donohue, 2006; Mellins, Kang, Cheng-Shiun, Havens, & Chesney, 2004; Watson,

Foster, & Friman, 2006). In other words, certain families may implement home behavioral interventions with higher integrity than others.

A common definition of treatment implementation integrity in consultation is the degree to which a consultee implements an intervention as designed (Gresham, 1989; i.e., adherence to intervention plans). Recent conceptualizations have expanded the construct to include dimensions of dosage, quality of program/intervention delivery, participant responsiveness, and program differentiation (Dane & Schneider, 1998; O'Donnell, 2008). The current study introduced a novel form of integrity, full engagement in the intervention implementation phase, which is operationalized as the degree with which consultees self-monitor, record, and submit documentation of integrity measures. With the exception of adherence to intervention, these dimensions are rarely measured nor their impact explored in consultation research. In addition, a systematic, standardized method for collecting integrity information has not been developed nor consistently used across studies. Three common methods for measuring intervention implementation integrity— (a) self-report (Colton & Sheridan, 1998), (b) permanent products (Mortenson & Witt, 1998), and (c) direct observations (Jones, Wickstrom & Friman, 1997) — are used inconsistently and unsystematically. To summarize, it is known that the integrity of an intervention influences child outcomes; however, very few consultation studies measure integrity especially in the home setting (Gresham, Gansle, & Noell, 1993a; Moncher & Prinz, 1991; Sheridan, Welch, & Orme, 1996).

The degree to which families implement the interventions as designed within CBC will have an impact on the child's progress. Thus, lack of intervention implementation integrity of home interventions could provide one explanation for why

CBC is not effective at reducing behavioral concerns for all children. Furthermore, if the child's behavior does not improve despite adequate implementation of the intervention, the potential confound of integrity can be ruled out. The current study aimed to expand the literature by not only measuring intervention implementation integrity systematically in the home setting, but also by examining two dimensions of integrity (i.e., adherence to intervention steps and full engagement in the intervention implementation phase) and the relationship between both dimensions, parenting stress, and child problem behavior at home.

### *Purpose of Study*

The purpose of this study was multifaceted. The primary goal was to fill the gap in the extant literature by determining the moderating and mediating roles of specific family context variables (i.e., parenting stress and positive parenting practices) on CBC treatment outcomes using a multilevel model of path analysis. Another purpose was to evaluate two dimensions of treatment integrity (i.e., adherence to intervention steps and full engagement in the intervention implementation phase) as possible mediators of the relation between parenting stress and change in child problem behavior at home. Specifically, the author aimed to understand the influence of parenting stress on families' abilities to implement behavioral interventions with adherence and fully engage in the CBC intervention implementation phase, and understand the influence of adherence and full engagement on CBC's treatment effect at home. An additional aim was to introduce a multimethod approach to measuring two dimensions of home intervention implementation integrity. The three models not only tested for relationships between

variables, but also accounted for the impact of the child's classroom environment. A final aim of the study was to understand the impact of classrooms/teachers on the models.

The following questions were addressed in this study:

1. Does parenting stress moderate the relationship between conjoint behavioral consultation and change in child problem behavior at home?
  - a) It was hypothesized that when families participate in CBC and experience high levels of parenting stress they will report less reduction in child problem behavior over time as compared to families participating in CBC and reporting lower levels of parenting stress (see path d in Figure 1).
  - b) It was hypothesized that when families do not participate in CBC and experience high levels of parenting stress they will report little to no reduction in child problem behavior over time as compared to families not participating in CBC and reporting lower levels of parenting stress (see path d in Figure 1).
2. Does parenting stress moderate the relationship between conjoint behavioral consultation and change in positive parenting practices (i.e., parental involvement and positive parenting)?
  - a) It was hypothesized that when families participate in CBC and experience high levels of parenting stress they will report less increase in the use of positive parenting practices over time as compared to families participating in CBC and reporting lower levels of parenting stress (see path e in Figure 1).



- b) It was hypothesized that when families do not participate in CBC and experience high levels of parenting stress they will report little to no increase in use of positive parenting practices over time as compared to families not participating in CBC and reporting lower levels of parenting stress (see path e in Figure 1).
3. Does change in positive parenting practices (i.e., parental involvement and positive parenting) partially mediate the relationship between conjoint behavioral consultation and change in problem behavior at home?
- a) It was hypothesized that when families participate in CBC they report more reductions in child problem behavior over time when compared to families who do not participate in CBC (see path a in Figure 1).
  - b) It was hypothesized that when families participate in CBC they report an increase in the use of positive parenting practices over time (see path b in Figure 1).
  - c) It was hypothesized that when parents report an increase in the use of positive parenting practices over time, they also report a reduction in child problem behavior at home (see path c in Figure 1).
  - d) Therefore, it was hypothesized that when families participate in CBC, they report an increase in use of positive parenting practices over time and more positive outcomes (more reductions in problem behavior at home) when compared to families who participate in CBC and do NOT report an increase in the use of positive parenting strategies (unless other mediator

variables exist) and when compared to families who do not participate in CBC (mediator effect).

4. Does adherence to behavioral interventions at home mediate the relationship between parenting stress and change in child problem behavior at home?
  - a) It was hypothesized that when families participating in CBC experience high levels of parenting stress they will report less reduction in child problem behavior at home over time when compared to families who report lower levels of parenting stress (see path a in Figure 2).
  - b) It was hypothesized that when families participating in CBC report high levels of parenting stress they will report lower levels of adherence to home interventions.(see path b in Figure 2)
  - c) It was hypothesized that when families participating in CBC report low levels of adherence to interventions, they will report less reduction in child problem behavior at home (see path c in Figure 2)..
  - d) Therefore, families participating in CBC who experience high levels of stress and low levels of adherence to interventions at home, they will report fewer reductions in child problem behavior over time (mediator effect).
5. Does full engagement in the intervention implementation phase at home mediate the relationships between parenting stress and change in child problem behavior at home?
  - a) It was hypothesized that when families participating in CBC experience high levels of parenting stress they will report less reduction in child

problem behavior at home over time when compared to families who report lower levels of parenting stress (see path a in Figure 3).

- b) It was hypothesized that when families participating in CBC report high levels of parenting stress they will report lower levels of engagement in the intervention implementation phase (see path b in Figure 3).
- c) It was hypothesized that when families participating in CBC report low levels of engagement in the intervention implementation phase, they will report less reduction in child problem behavior at home (see path c in Figure 3).
- d) Therefore, families participating in CBC who experience high levels of stress and low levels of engagement in the intervention implementation phase, they will report less reduction in child problem behavior over time (mediator effect).

6. Does the classroom/teacher significantly affect each model?

- a) It was hypothesized that a significant classroom/teacher effect was present in each model.

These questions are illustrated in Figures 1, 2 and 3.

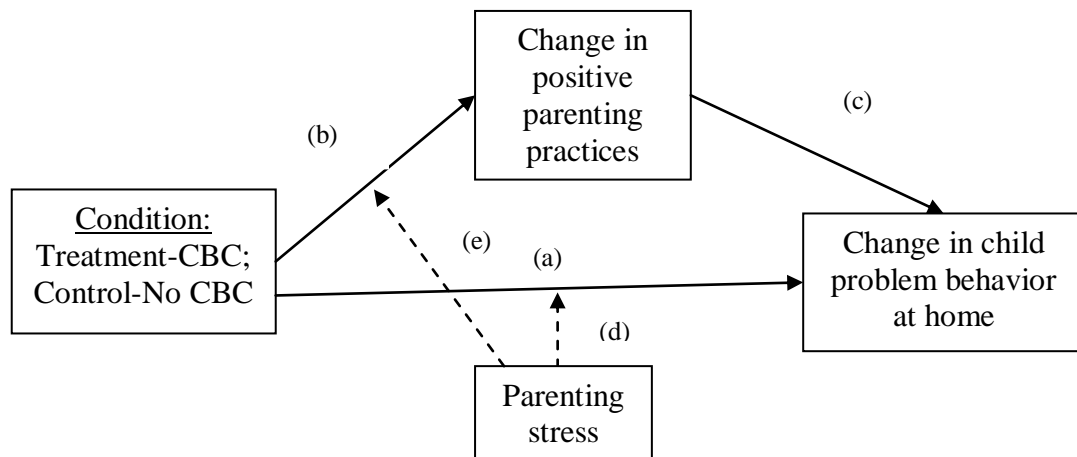


Figure 1. Model 1: Conceptual Model for the Partial Mediator Role of Change in Positive Parenting Practices and Moderator Role of Parenting Stress.

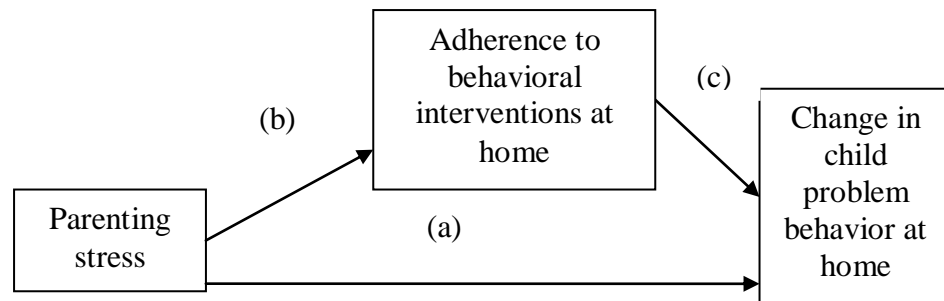


Figure 2. Model 2a: Conceptual Mediator Model for Adherence to Home Behavioral Interventions.

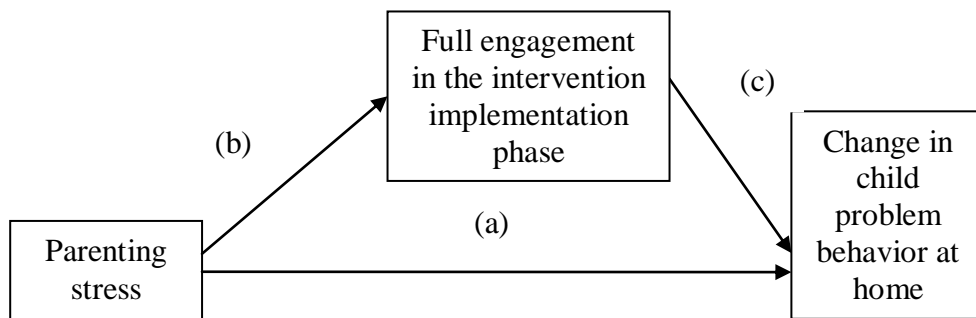


Figure 3. Model 2b: Conceptual Mediator Model for Full Engagement in the Intervention Implementation Phase.

## CHAPTER 2

### Review of the Literature

The purpose of this study was to determine the moderating and mediating roles of the family context (i.e., parent stress level and parenting practices) on the relationship between conjoint behavioral consultation (CBC) and change in child problem behavior in the home by conducting a multilevel model path analysis. Another aim of the study was to evaluate the mediational role of two forms of home intervention implementation integrity (i.e., adherence to behavioral interventions and full engagement in the intervention implementation phase) on parenting stress and change in child behavior problems for families involved in CBC. Again, a multilevel structural model of analysis was conducted to test the relationships in the model and account for classroom effects. An additional aim was to introduce a multimethod approach to measuring two dimensions of home intervention implementation integrity. The three models not only tested for relationships between variables, but also accounted for the impact of the child's classroom environment. A final aim of the study was to understand the impact of classrooms/teachers on the models. In sum, the broad purpose was to discover families that may benefit most from CBC, and families who may need additional support throughout the process, specifically to increase adherence to interventions, increase engagement during the intervention implementation phase, reduce stress, and improve parenting practices.

The objective of this chapter is to review the current literature regarding relational pathways between family context variables and family-oriented treatment outcomes. This chapter will review research in many fields including developmental psychopathology,

school psychology, clinical psychology, social work, and psychiatry. The research reviewed focuses on children diagnosed with disruptive behavior disorders (Attention Deficit Hyperactivity Disorder, Oppositional Defiant Disorder, and Conduct Disorder) and children who exhibit disruptive behavior but are not diagnosed with a disorder. For clarity, it is important to note that children with disruptive behavior may also be referred to as children who display conduct problems, externalizing behavior, antisocial behavior, behavior concerns or behavior problems. All of these referenced children are smaller samples of the larger population of children exhibiting disruptive behavior concerns.

The research will be reviewed in the following order. First, literature explaining the typical characteristics of families with children who exhibit disruptive behavior will be reviewed. Second, empirically-based indirect service delivery models that involve families will be described and the research to support the use of these models reviewed. Behavioral parent training and conjoint behavioral consultation are two such models. The family factors which have been shown to influence treatment outcomes will be reported and the research reviewed. Next, this chapter will summarize relevant research on treatment integrity and comparable topics such as, treatment fidelity. Literature describing intervention integrity measurement and research examining the influence of treatment integrity on treatment outcomes and the impact of family characteristics on treatment integrity will be reviewed. In conclusion, a summary of existing research findings and gaps in the literature bases will be discussed.

### *Disruptive Behavior Disorders*

The rates of children with mental health concerns in the United States are alarming. Seventeen to twenty-six percent of youths in the United States are in need of

mental health services (McKay & Bannon, 2004). Other reports state that 6% to 25% of children and adolescents are experiencing childhood psychopathology (Maughan, Christiansen, Jenson, Olympia, & Clark, 2005). However, fewer than 20% of children who require mental health services are receiving them and when services are delivered, the treatments are rarely evidence-based (Kazdin, 2007).

Children who exhibit disruptive behavior or externalizing behavior are one such population of children with mental health needs. This group of children has been called hyperactive, impulsive, deviant, anti-social, delinquent, out-of-control, noncompliant, and emotionally or behaviorally disturbed (Maughan et al., 2005). When a child exhibits externalizing behavior in a pattern that disrupts the child's functioning, he or she may be diagnosed by a professional as having one or more of the disruptive behavior disorders in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (4<sup>th</sup> edition; DSM-IV; American Psychiatric Association, 2000).

The *DSM-IV* (2000) identifies three specific disorders under the heading of disruptive behavior disorders including Attention Deficit Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD). Children who are diagnosed with ADHD exhibit behaviors such as abnormal levels of inattention, impulsivity, and hyperactivity (DSM-IV-TR, 2000). Conduct problems are classified as ODD or CD depending on the seriousness of the acts and the age of the child (Frick, 1994). ODD is characterized by patterns of hostile, noncompliant, and defiant behavior without serious acts that defy the rights of other humans, and CD is defined by a pattern of severe conduct problems that may violate the rights of others (Frick, 1994). Impulsive, defiant, and hostile behavior impact communities in significant ways as

behavior concerns are the most frequent referrals to mental health centers (Reed & Sollie, 1992). For example, 4% to 6% of children are diagnosed with ADHD (Johnston & Mash, 2001) and 7% to 20% of children meet criteria for ODD and CD (Webster-Stratton, Reid, & Hammond, 2001). These prevalence rates are even higher for families of low-income or for families experiencing high stress (Webster-Stratton, 1998). Moreover, symptoms of disruptive behavior disorders typically emerge during early childhood and are stable over time (Webster-Stratton et al., 2001). Children with conduct problems appear to continue antisocial behavior into adolescence and adulthood (Reed & Sollie, 1992). As the prevalence of disruptive behavior concerns increases, the need for effective services increases.

Even with the large need of services for families and children with disruptive behavior, only a small percentage of these families receive treatment. For example, only 10% of children who need services for ODD or CD receive services (Webster-Stratton et al., 2001). The absence of service delivery may lead to poor prognosis. Children with ADHD and conduct problems are predicted to develop more serious problems and poor outcomes in adolescence and adulthood, such as antisocial behavior, substance abuse, and violence (Hartman, Stage, & Webster-Stratton, 2003; Pelham, Wheeler, & Chronis, 1998). Disruptive behaviors can also negatively affect a child's psychosocial functioning, peer relationships, academic achievement, school attendance, aggressive behavior, self-esteem, and mental health in general (Anastopoulos, Guevremont, Shelton, & DuPaul, 1992).

If children with disruptive behavior concerns do not receive effective services, they are at risk for experiencing dire outcomes which may then have a detrimental effect



on society (Mannuzza & Klein, 1999). Families, schools, and communities are impacted by untreated childhood disruptive behavior disorders. Families of children who exhibit disruptive behavior report increased stress levels and family conflicts (Barkley, 1981; Fischer, 1990). Schools have the primary responsibility to educate children in academics; however, when children have disruptive behavior concerns, schools gain the additional responsibility to teach behavior management and social skills to teachers and children. Many schools do not have the time or financial resources to provide effective behavioral support to children. Communities are impacted because behavior problems are associated with delinquent behavior, criminal activity, and unemployment making disruptive behavior disorders one of the most costly mental health disorders (Fergusson, Horwood, & Ridder, 2005; Kazdin, 1995). Therefore, researchers and practitioners should commit to investigating and practicing effective and comprehensive services for children who exhibit behavioral concerns, their families, and communities.

### *Families of Children who Exhibit Disruptive Behavior*

#### *Ecological-Behavioral Theory*

Research investigating the development of childhood disruptive behavior and the treatment of disruptive behavior are based on an ecological-behavioral approach. Ecological theory emphasizes the important role of multiple environments and the interactions occurring within and between systems on a child's development and behavior (Bronfenbrenner, 1977). Ecological theory suggests that children with disruptive behavior have developed these behaviors by interacting within multiple systems (e.g., family, school, peers). Unfortunately, the ecological framework does not provide a clear model for treatment.

Unlike ecological theory, behavioral theory drives evidence-based models of service delivery. Behavioral theory explains that a child's behavior is learned while interacting with the environment, and thus by altering environmental contingencies, a child's behavior can be altered. This theoretical perspective focuses on the present situation and the environmental conditions contributing to the child's behavior. More specifically, social learning theory highlights that children learn from interactions with other individuals and observations of models (Patterson, 1986). Patterson's theory of coercion (Patterson, 1982) conceptualizes conduct problem behaviors as developed in the home through maladaptive interactions with family members (Patterson, Reid, & Dishion, 1992). Patterson (1982) states that child rearing or qualities in the parent-child relationship are crucial to a child's development. Behavioral theories suggest disruptive behavior is learned and such behavior continues because environments, such as family and school environments reinforce the behavior.

Together ecological and behavioral theories support the notion that children who exhibit disruptive behavior learn this behavior by interacting with multiple environments and systems. Ecological theory stresses the importance of looking beyond the child for contributors to behavior and examining the larger environmental context, while behavioral theories stress the influence of present antecedents and consequences occurring before or after the disruptive behavior. The studies that will be reviewed are based on the underlying assumptions of an eco-behavioral approach and support the theories by demonstrating that the family context is associated with behavior problems in children and affect the outcomes of treatment.

#### *Family Characteristics as Risk Factors*

There is an immense amount of research linking parenting to disruptive behavior disorders. Meta-analyses and research reviews have identified multiple family factors related to disruptive behavior problems, conduct problems, and delinquency (Frick, 1994; Johnston & Mash, 2001; Loeber & Stouthamer-Loeber, 1986). Families of children with disruptive behavior disorders tend to be characterized by considerable stress, economic disadvantage, unstable family structure, and inconsistent and highly punitive discipline approaches (Maughan et al., 2005; Webster-Stratton, 1998). The current study examined the role of specific variables (i.e., parenting stress and parenting practices) that have been shown to predict behavior problems and influence treatment outcomes. Research on parenting stress and parenting practices and involvement will be reviewed.

One key familial factor that influences a child's behavior is parental stress level. It is well established with various samples that parents of children with problem behavior experience high levels of stress and report negative feelings and irrational thoughts about parenting and their competence at parenting (Bagner et al., 2009; Frick, 1994; Huth-Bocks & Hughes, 2008; Spratt, Saylor, & Macias, 2007; Suarez & Baker, 1997; Webster-Stratton, 1990). Families who experience high levels of stress also view their children as more oppositional and deviant than families under less stress suggesting that parent's views of their children are altered by stress (Webster-Stratton, 1990). Specifically, mothers experiencing parenting stress are more sensitive to behavior problems and resort to physical punishment (McPherson, Lewis, Lynn, Haskett, & Behrend, 2008). Fathers reporting high levels of stress due to parenting difficulties are more likely to express anger and become aggressive towards their children than fathers experiencing less parenting stress (Francis & Wolfe, 2008).

Environmental stress along with challenging child behavior may influence a parent's response to their children and thus the child's behavior. Moreover, neighborhoods with immense stress and societal disadvantages, such as low family income, poverty status, and little parental education, have been found to be predictive of antisocial and disruptive behavior (Dubow, Edwards, & Ippolito, 1997; Duncan, Brooks-Gunn, & Klebanov, 1994; Reed & Sollie, 1992; Suarez & Baker, 1997; Webster-Stratton 1990). In sum, children in families and neighborhoods with increased stress typically exhibit behavior problems. However, the specific role of stress in the development of childhood disruptive behavior is unknown because stress is also associated with poor parenting, parental psychopathology, financial struggles, social support, and other predictors of childhood behavior problems (Huth-Bocks & Hughes, 2007; Patterson, 1982; Reid & Patterson, 1989; Suarez & Baker, 1997; Webster-Stratton, 1990). In addition, it is unknown whether family stress leads to child behavior problems or if behavior problems lead to stress. Given that family stress level and child behavior have a bidirectional relationship, it is crucial that treatment focus on decreasing child disruptive behavior and decreasing stress in the family.

Parental involvement and harsh, inconsistent parenting practices are the most consistently linked familial factors to childhood disruptive and problem behavior (Beauchaine et al., 2005; Frick, 1994; Kazdin, 1987; Pardini, Fite, & Burke, 2007; Reid & Patterson; 1989; Webster-Stratton & Herbert, 1994). Lack of parental involvement, parental supervision, and parental monitoring are the strongest predictors of conduct problems in children (Shelton et al., 1996). Additionally, parents of children with behavior problems often use ineffective, inconsistent discipline and have coercive parent-

child exchanges with limited warmth (Campbell, Shaw, & Gilliom, 2000; Gardner, 1989). Specifically, parents who do not establish and enforce household rules nor monitor their children, and inconsistently deliver punishment and rewards demonstrate an inconsistent parenting style (Patterson, 1982). A study involving observations of mothers and children with and without conduct problems resulted in a strong correlation between inconsistent parenting and parent-child conflict (Gardner, 1989). The group of mothers and children with conduct problems experienced more parent-child conflict versus the control group. Furthermore, conduct problems increase over time when parents use ineffective parenting and physical punishment. Oppositional and defiant children tend to emulate their parent's hostile verbal behavior and physical aggression (McLeod, Kruttschnitt, & Dornfeld, 1994; Pardini et al., 2007; Patterson 1995; Patterson, 2002; Snyder & Stoolmiller, 2002).

Further research supports a bidirectional relationship between parenting practices and child problem behavior; parenting practices predict child behavior and child behavior predicts parenting practices (Laird, Pettit, Bates, & Dodge, 2003; Pardini et al., 2007; Vuchinich, Bank, & Patterson, 1992). For example, studies indicated significant bidirectional relationships between poor parental monitoring and increased delinquency, between parental discipline and antisocial behavior, and between all parenting practices (i.e., poor parent-child communication, physical punishment, low positive reinforcement use, poor monitoring, timid parenting, and low parental involvement) and conduct problems (Laird et al., 2003; Pardini et al., 2007; Vuchinich et al., 1992). One study investigated this reciprocal relationship with a sample of children diagnosed with a disruptive behavior disorder (Burke, Pardini, & Loeber, 2008). Results indicated greater

influence from child behaviors to parenting practices and differences among children with distinct diagnoses. A child diagnosis of Oppositional Defiant Disorder (ODD) predicted poor parent-child communication, increased parent use of timid discipline, and decreased parental involvement. A child diagnosis of ODD was predicted by timid discipline; a child diagnosis of Conduct Disorder predicted poorer supervision and a child diagnosis of Attention Deficit Hyperactivity Disorder was neither predictive of, nor predicted by parenting behaviors. On the contrary, when parents use positive parenting practices (e.g., praise), demonstrate appropriate amounts of punishment, and implement family routines, their children are less likely to exhibit problem behaviors and are more likely to display higher levels of prosocial skills (Koblinsky, Kuvalanka, & Randolph, 2006; Shelton et al., 1996). In light of this information, it is important to teach parents with children who exhibit disruptive behaviors to be consistent, positive, and involved.

In summary, the research reviewed suggests that parental stress and environmental or socioeconomic stress predict disruptive behavior and conduct problems in children. Parental involvement and parenting practices are also predictive of child behavior problems. Given this information, services should include components to decrease family stress, improve parent-child relationships, and teach consistent and positive parenting practices.

*Empirically Supported Service Delivery Models for Families of Children with Disruptive Behavior*

Given the impact that families have on a child's development, and the association between family context variables and child disruptive behavior, it is vital to include families in the treatment of child disruptive behavior. Research based on ecological-

behavioral theory supports various service delivery models for the treatment of children who exhibit disruptive behavior including indirect models of service delivery. Two such indirect service delivery models with empirical support are (a) behavioral parent training, and (b) conjoint behavioral consultation. The present study will focus on the latter form of service delivery; however, future consultation research can draw ideas from behavioral parent training research because research in behavioral parent training is more developed and has investigated mediators and moderators of treatment outcomes. First, behavioral parent training models, treatment outcome research to support the use of such models, and mediator/moderator research will be described. Second, structured behavioral consultation and conjoint behavioral consultation with families and schools will be described and outcome research reviewed.

#### *Behavioral Parent Training for the Treatment of Disruptive Behavior in Children*

Behavioral parent training is an evidence-based model of service delivery that is built upon the concepts of behaviorism and social learning theory (Briesmeister & Schaefer, 1998). Ecological theories and research state that the home environment will influence the child's behavior. Thus, the goal of behavioral parent training is to enhance and build parenting skills and in turn alter the child's behavior. To enhance parenting practices, behavioral parent training involves three main components: (a) education on childhood behavior problems and effective parenting practices, (b) modeling of effective parenting practices, and (c) role-playing parenting strategies. The components of parent training have been shown to reduce child behavior concerns and parent-child conflicts, thus demonstrating the importance of including parents in treatment and training them as co-therapists.

Across behavioral parent training treatment studies, various empirically supported behavioral parent training models have similar outcomes, theoretical frameworks, and goals. Behavioral parent training has been determined to meet the criteria for well-established treatments by consistently resulting in the following outcomes: (a) reduced child disruptive behavior and conduct problems; (b) improved parenting attitudes, functioning, and skills; and (c) increased cost-effectiveness (Estrada & Pinsof, 1995; Eyberg & Boggs, 1998; Pelham, Wheeler, & Chronis, 1998; Sanders et al., 2004; Webster-Stratton & Hancock, 1998). These findings may be due to the fact that all empirically supported parent training models follow an ecological and behavioral theoretical framework and aspire to meet similar goals (e.g., reduce child disruptive behavior and improve parenting practices and attitudes).

The goals of behavioral parent training are comparable across models. For example, multiple models aim to build a positive relationship between a parent and child, strengthen parenting competence and skills, strengthen family functioning, teach the child positive behaviors, and decrease disruptive behavior and conduct problems (Cunningham, 2005; Eyberg & Boggs, 1998; Webster-Stratton & Hancock, 1998). Thus, multiple versions of parent training models teach parents strategies for coping with developmental issues and child behavior problems; train parents in positive parenting skills, generalization and enhancement strategies; and instruct parents in how to use stress coping skills and partner support skills (Sanders et al., 2004). As an illustration, most parent training models include sessions on positive parenting and behavior management skills such as the use of positive attention, effective rewards, planned ignoring, token systems, transitional warnings, consistent consequences, planning ahead, and time out



(Cunningham, 2005). Thus, behavioral parent training models result in similar outcomes, follow an ecological-behavioral approach, and teach similar parenting skills to meet related goals. Therefore, it seems logical to conclude that if parent training models follow an ecological-behavioral framework and teach related parenting strategies, the outcomes of the model will be analogous regardless of the procedures or format used.

*Child behavior outcomes following parent training.* As previously stated, behavioral parent training results in improved child behavior outcomes (Eyberg & Boggs, 1998; Pelham et al., 1998; Thomas & Zimmer-Gembeck, 2007; Webster-Stratton & Hancock, 1998; Webster-Stratton, Reid, & Stoolmiller, 2008). Treatment outcome studies indicate that parent training programs yield improvements in the child's behavior consistently at home and in school when compared to normal comparison groups or when post-test versus pre-test measurements were collected (Pelham et al., 1998). More specifically, treatment outcome research has shown that parent training results in reductions in child conduct problems and disruptive behavior (Boggs et al., 2004; Eyberg & Boggs, 1998; Sanders et al., 2004; Serketich & Dumas, 1996; Webster-Stratton & Hancock, 1998) and increases in child compliance (Eyberg & Boggs, 1998). Generalization studies demonstrate that the increases in positive behavior and decreases in disruptive behavior generalize to the home and school setting (Eyberg & Boggs, 1998). Additionally, reductions in child disruptive behavior and conduct behavior, and increases in positive behavior maintain in follow-up studies (Cunningham, Bremner, & Boyle, 1995; Eyberg & Boggs, 1998; Serketich & Dumas, 1996; Taylor & Biglan, 1998).

*Parent behavior outcomes following parent training.* Parent training models are effective at not only changing child behavior, but also at changing parent/family related

variables (e.g., behavior and attitudes). Studies have shown a significant change in parent interaction style with their child by increasing the amount of praise given to their children (Eyberg & Boggs, 1998; Webster-Stratton & Hancock, 1998). Additionally, parent training effectively improves parental attitudes and confidence (Estrada & Pinsof, 1995; Webster-Stratton & Hancock, 1998). Models for children at-risk for developing conduct problems have demonstrated effectiveness at reducing maternal depression, increasing social and problem-solving skills and promoting effective problem-solving and communication in parents (Webster-Stratton, 1994). Mothers of moderate-to high-risk children are more supportive, less critical, and able to strongly bond with their children when they participate in parent training (Reid, Webster-Stratton & Hammond, 2007). Parent training also has been shown to improve parent behavior management skills, decrease parent stress, and improve family relationships (Estrada & Pinsof, 1995). Other models are effective with various family stressors such as families experiencing conflict or psychopathology, divorced families, families of children with behavior problems in rural areas, children with ADHD, and children at risk for abuse or neglect (Sanders et al., 2004). In sum, various forms of parent training can be effective at improving parenting skills, attitudes, and parent-child interactions for multiple populations of children and families. Moreover, the positive results of behavioral parent training seem to be maintained over time (Serketich & Dumas, 1996; Taylor & Biglan, 1998).

One meta-analysis analyzed the effectiveness of behavioral parent training as a treatment for externalizing behavior and disruptive behavior disorders (Maughan et al., 2005). Effectiveness of behavioral parent training models from 1966 to 2001 were analyzed indicating this method of intervention as an effective intervention for modifying

the behavior problems of children over time, although the results were not as robust as found in previous studies. Additionally, the authors noted that across each of the experimental designs, the type of intervention served as a significant moderator variable. Other important findings include: (a) training adults who have a greater and more frequent influence on the child to manage behavior will increase the likelihood of positive behavior change; (b) working with parents is necessary to decrease parent stress and increase parental confidence; and (c) training parents in groups and within 12 sessions can effectively change behavior of children and parenting skills with greater cost-effectiveness.

A recent meta-analysis reported behavioral outcomes of two popular parent training programs, Parent-Child Interaction Therapy (PCIT) and Triple P-Positive Parenting Program (Thomas & Zimmer-Gembeck, 2007). Authors reviewed 24 studies and evaluated and compared the outcomes of the two parent training programs. Both programs led to positive outcomes for children and improvements in parenting practices; however, these results depended on the intervention length, components, and measures used to assess outcomes. Longer and enhanced versions of parent training programs and programs that assessed child behavior outcomes using parent report and parent observation of child behavior showed larger effect sizes. Comparisons of PCIT and Triple P program outcomes demonstrated significant large effects of PCIT on children's behavior and medium effects of Triple P on children's behavior. More research is needed to understand the long-term effects of these and other parent training programs.

*Summary of parent training treatment outcome studies.* It is evident that parent training is a robust model of treatment that is effective with a variety of families who

have children that exhibit disruptive behavior. Various models are effective with families of children with a range of skills and concerns. Moreover, parent training skills and outcomes have been shown to generalize to the home and school setting especially when the teacher training component was added to the model (Owens et al., 2005; Powers & Roberts, 1995; Serketich & Dumas, 1996; Webster-Stratton, 1998; Webster-Stratton, 2001). Parent training models have also been expanded and altered to meet the needs of various populations of children. Nevertheless, some families do not have access to these services, and even when services are available a significant number fail to enroll or complete the intervention (Cunningham, 2005). Therefore, further research on the efficacy of parent training is needed; in particular mediator and moderator models need to be examined.

*Mediators and moderators to parent training treatment outcomes.* Mediator and moderator roles in the parent training treatment-outcome relationship have been investigated. Moderator and mediator research can give practitioners and researchers more information about how to increase the effectiveness of parent training. A *moderator* is a variable that affects the direction or strength of the relationship between the independent and dependent variable (Baron & Kenny, 1986). Research that tries to specify for whom a treatment is effective, or under what conditions a treatment is effective is measuring *moderator* variables of treatment outcomes (Baron & Kenny, 1986; Beauchaine et al., 2005). For example, the socioeconomic status (SES) of a child may be a possible moderator of the relationship between behavioral parent training treatment and outcomes. *Mediators* are variables on which the treatment exerts its effects and accounts for variability in the treatment effect (Baron & Kenny, 1986; Beauchaine et

al., 2005). *Mediators* are variables that explain how or why the treatment effects occur (Baron & Kenny, 1986). For example, parenting skills may be a possible mediator of parent training treatment and child outcomes. Thus, both mediator and moderators provide additional information about the treatment-outcome relationship.

Some researchers are studying the moderators and mediators of behavioral parent training response and the mechanisms of behavior change to identify who would most likely benefit from interventions. Several parent training interventions for children with conduct problems and disruptive behavior have been shown to be efficacious or promising (Beauchaine et al., 2005); however, not all children and families show improvements or positive outcomes after treatment. Even very successful treatments, like parent training for children with conduct problems, are only effective with two-thirds of participating children (Webster-Stratton & Hammond, 1997). The question asked is, “For whom does this treatment work?” It is important to understand what mechanisms or factors alter the effectiveness of interventions or programs within different subsamples of families (Brestan & Eyberg, 1998).

Many child, family, or parent variables could serve as moderators or mediators to parent training treatment outcomes. For example, child-specific variables such as comorbid symptoms may be moderators. Family-specific variables like parenting stress have also been shown to be moderators of treatment outcomes, associated with child behavior problems and predictive of child problem behavior. Moreover, there are many variables to examine as possible mediators. In past research, parenting practices have consistently accounted for the variance of behavioral outcomes after treatment (Hinshaw et al., 2000). The current study explored the impact of parenting stress and parenting

practices on treatment outcomes. Therefore, the following paragraphs will review research that has investigated parenting stress and parenting practices as predictors of parent training outcomes, and mediators and moderators within the relationship of parent training and outcomes.

*Stress.* Parenting stress and/or negative life events influence the effectiveness of parent training programs (Kazdin & Wassell, 1999; Lundahl et al., 2006; Reyno & McGrath, 2006; Webster-Stratton, 1985; Webster-Stratton & Hammond, 1990; Werba, Eyberg, Boggs, & Algina, 2006). Stress is a predictor of treatment outcomes and a moderator of the relationship between parent training and child behavior outcomes. Specifically, amount of negative life stress predicts mother and father reports of child behavior after treatment (Webster-Stratton & Hammond, 1990). When a father is present in the home, the amount of negative life stress experienced by the family predicts child deviance. In a similar study involving a combined treatment of parent training and child problem-solving training, families experiencing high stress respond the least well to treatment (Kazdin & Wassell, 1999). Parenting stress predicts therapeutic change from pre- to post- treatment and stressors on a family appear to be barriers significantly associated with treatment response.

Families also report that stressors are barriers to treatment response (Kazdin & Wassell, 1999). Clearly, families characterized by low socioeconomic status, single-parent status, and parent psychopathology and children with severe problem behaviors experience stressors. It is not a coincidence that these families also respond the least well to treatment (Dumas & Wahler, 1983; Kazdin & Wassell, 1999; Lundahl et al., 2006; Reyno & McGrath, 2006; Webster-Stratton, 1985; Webster-Stratton & Hammond, 1990;

Werba, Eyberg, Boggs, & Algina, 2006). Thus, it is unclear what family characteristics directly affect treatment response. One meta-analysis surprisingly found parental stress and/or negative life stress to yield a small mean weighted effect size (.1 to .3) as a predictor of treatment response yet socioeconomic status, parental education, severity of child behavior problems, and maternal psychopathology presented large and moderate effect sizes (.3 to .5, moderate; .5 to 1.0, large) as predictors of treatment response. Other studies disconfirm these findings and show stress does not influence outcomes (Hartman, Stage, & Webster-Stratton, 2003; Hemphill & Littlefield, 2006; Webster-Stratton, 1992). Results are inconsistent when exploring the impact of parenting stress or negative life stress on treatment response.

*Parenting practices.* Further investigations confirmed that family variables moderate treatment response and expanded the literature by examining parenting skills and practices as a possible mediator (Beauchaine et al., 2005). One such study combined data from six randomized clinical trials and included 514 children ages three to eight years old. The treatment provided was *The Incredible Years Parent Training Program* (Webster-Stratton, 1990). In addition, children were provided social skills and problem-solving classes and teachers completed a teacher training program similar to the parent training program. Latent growth curve models of child behavior were constructed and results indicated that marital adjustment, maternal depression, paternal substance abuse, and child comorbid anxiety/depression each moderated treatment response. Additionally, critical, harsh, and ineffective parenting both predicted and mediated outcomes. When parents scored low on each of the parenting constructs before treatment and improved parenting skills throughout treatment, outcomes were most favorable for their children.

Parents who used less coercive, less critical and more effective discipline practices, and completed parent training had children who improved most by decreasing externalizing problems (Beauchaine et al., 2005). Lastly, interventions with parent training were more effective at treating conduct problems than interventions without parent training.

Parenting practices also impact a child's response to treatment at school (Hinshaw et al., 2000). When parents participate in a multimodal treatment program including individual and group parent training, and they reduce negative and ineffective discipline strategies, their child reduces disruptive behavior at home and improves social skills at school.

Thus, children may not respond to parent training treatment because their parents are using ineffective and harsh parenting practices and not adhering to the positive parenting strategies taught during parent training.

One long-term follow up study by Webster-Stratton (1990) involved a total of 124 parents of children with conduct problems. The families received parent training three years prior. Results of the follow-up studies indicated that 25% to 46% of parents reported that their children failed to show improvements in behavior after three years. These families of children with continued behavior concerns were often characterized by single-parent status, increased maternal depression, lower social class status, and family history of alcoholism and drug abuse. Thus, these family variables may play a role in long-term parent training treatment outcomes and service providers may need to provide booster sessions to maintain treatment effects.

*Summary.* In sum, behavioral parent training is an evidence-based direct method of service-delivery for families of children with disruptive behavior concerns. Parental stress, life stress, and social support have been linked to treatment response (Beauchaine



et al., 2005; Lundahl et al., 2006; Reyno & McGrath, 2006; Webster-Stratton, 1990).

Moreover, research has identified mediators (e.g., parenting) and moderators (e.g., parental stress) to treatment response. Further research identifying other possible mediators and moderators of treatment outcomes is needed. Replication studies need to be conducted to confirm or disconfirm previous moderator/mediator investigations of treatment outcomes of behavioral parent training.

Future research in the area of behavioral parent training needs to involve multiple systems in the treatment model and measure family, school, and child outcomes.

Behavioral parent training leads to effective and meaningful outcomes for children and families; however, one weakness of parent training programs is that most do not involve multiple systems in the treatment of children with disruptive behavior. For example, the school setting is one setting in which children with disruptive behavior concerns typically exhibit problem behaviors and have academic concerns. Students with behavior problems fail more courses, earn lower grade point averages, miss more days of school, and are retained more than other students (Wagner, Blackorby, Cameto, & Newman, 1993). Moreover, it is important to include schools in treatment because 95% of children are enrolled in school and exhibit behavior concerns at school (Walter et al., 2005).

Therefore, it is crucial to involve schools in the treatment of children with disruptive behavior in combination with parent focused interventions. Parent training models that include school interventions lead to superior effects; however, parent training models involving schools are limited and the results are inconsistent (Ollendick, 2005; Valdez, Carlson, & Zanger, 2005). Other empirically based methods of indirect service delivery,

such as conjoint parent and teacher consultation models (e.g., conjoint behavioral consultation), promote work with families and schools through collaborative efforts.

*Parent Consultation as a Treatment Model for Families of Children with Disruptive Behavior*

Multiple forms of consultation exist including mental health consultation, behavioral consultation, and organizational consultation (Erchul & Martens, 2002). Behavioral consultation is the most widely used and empirically-supported method of consultation (Guli, 2005) because it is specific, operationalized, and uses objective and clear protocols, interviews, and measurements. In addition, behavioral consultation is based on principles of behavior analysis and these techniques have been demonstrated to be effective (Martens, 1993).

Behavior consultation is an indirect model of service delivery used in applied settings such as schools, primary care pediatric settings, and home settings to treat a variety of childhood concerns. Typically, behavioral consultation is implemented in schools (school consultation) and involves teachers; however, behavior consultation is also used with parents (parent consultation) or schools and parents together (conjoint behavioral consultation). This review will describe and summarize the research conducted on the effectiveness of parent and school behavioral consultation with families and schools of children exhibiting disruptive behavior concerns. Structured parent behavioral consultation and conjoint behavioral consultation are evidence-based consultation models (Guli, 2005).

*Structured behavioral consultation.* Behavioral consultation is an effective model of intervention delivery for behavioral and emotional concerns (Guli, 2005). This method

of consultation has been described as a structured, indirect, collaborative, problem-solving process between a consultant and consultee (i.e., parent). Behavioral consultation involves four stages based on problem-solving objectives (Kratochwill & Bergan, 1990): problem identification, problem analysis, treatment implementation, and treatment evaluation (Kratochwill & Bergan, 1990). Behavioral consultation aims to change the consultee's behavior to produce change in the child's behavior. Therefore, the goals of consultation include producing change in a child's behavior indirectly through a collaborative problem-solving framework and empowering the consultee with skills for future problem-solving (Kratochwill, Elliott, & Callan-Stoiber, 2002).

Multiple studies indicate that behavioral consultation is an effective method of intervention delivery. Past reviews on consultation outcomes indicate that behavioral consultation is more effective than mental health and organizational consultation models (Medway, 1979; Reddy, Barboza-Whitehead, Files, & Rubel, 1998). Furthermore, outcome studies show that behavior consultation is effective at decreasing behavior problems in the home and school setting and changing consultee behavior (Medway & Updyke, 1985; Sheridan, Welch et al., 1996). Results indicate consultees learn new skills and techniques and increase their use of psychological services when they participate in behavioral consultation (Reddy et al., 1998). In general, 76% of published consultation studies conducted between 1985 and 1995 indicated positive results for children (Sheridan, Welch et al., 1996). Specifically, 95% of behavioral consultation studies resulted in positive child outcomes compared to 60% of mental health consultation studies and 38% of other consultation models reporting positive outcomes. Lastly, it was demonstrated that behavioral consultation had made many methodological advances in

multiple areas such as design of the study, methods of measurement, and attention to social validity (Sheridan, Welch et al., 1996).

Small n research has been conducted to study the effectiveness of behavioral consultation for children with disruptive behavior. For example, one study examined the efficacy of school-based behavioral consultation for treating children with externalizing behavior concerns (Wilkinson, 1997). Results indicated a significant decrease in externalizing behavior at school across baseline and treatment phases. In addition, behavior rating scale results for 2 of the 3 participants demonstrated significant reductions in aggressive behavior, delinquent behavior, and externalizing behavior from pre-treatment to post-treatment. Similarly, another study showed that a behavioral consultation model (i.e., home-school communication model) for children with behavior disorders improved communication between home and school and led to improvements of target behaviors (Evans, Okifuji, Engler, Bromley, & Tishelman, 1993). When compared to a control group, fewer children were placed in special education when their parents and teachers received the home-school communication model of behavioral consultation. When paired with a teacher training program, the use of behavioral consultation improved teacher's confidence and use of positive instructional practices above and beyond the teacher professional training program alone, while also decreasing student disruptive behavior (Shernoff & Kratochwill, 2007). It seems behavioral consultation has unique components that aid in teacher professional development and facilitate improvements in child classroom behavior and reductions in child externalizing behavior at home.

Behavioral consultation is not only effective at decreasing externalizing problems and increasing the skills of consultees, it is also a practical model of service delivery. Behavioral consultation is considered to be cost-effective because it is conducted within a school setting whereby professionals and family members can join together for the ultimate goal of child success in multiple settings (Meyer & Janney, 1992). The costs and benefits of behavioral consultation appear to suggest this form of service delivery is cost-efficient and feasible. Personnel costs associated with behavioral consultation are relatively low. The Metropolitan Area Child Study Research Group and Gorman-Smith (2003) estimated teacher consultation per year to require .25 Full-Time Equivalent (FTE) of a doctoral- or predoctoral-level consultant, plus the costs associated with training and supervision of the consultant. FTE is one way to measure employee involvement; an FTE of 1.0 is equivalent to a full-time worker, while an FTE of 0.25 indicates the consultant is quarter-time.

*Conjoint behavioral consultation.* One model of consultation, conjoint behavioral consultation (CBC; Sheridan, Kratochwill & Bergan, 1992; Sheridan & Kratochwill, 2008), combines schools and families in the problem-solving process. It is one of the few structured and validated models of consultation that joins families and schools. CBC is defined as “a structured, indirect form of service-delivery, in which parents and teachers are joined to work together to address the academic, social, or behavioral needs of an individual for whom both parties bear responsibilities” (Sheridan & Kratochwill, 1992, p. 122). It is an extension of behavioral consultation that is created to facilitate collaboration between home and school settings, encourage parent engagement,

strengthen the relationship between both systems, and effect child behavior change (Sheridan & Kratochwill, 2008).

Parents play a significant role on a child's behavior and learning in school. For example, parent support of learning predicts up to 60% of the variance in academic achievement (Christenson & Buerkle, 1999). High, realistic parent expectations, the use of effort attributions for school performance, parent's structure and support of learning, positive emotional interactions between parent and child, and a parent's use of an authoritative parenting style can promote school success for children (Christenson, Rounds, & Gorney, 1992). Parents and teachers working together in consultation helps identify similarities and differences between settings, develop consistent behavioral interventions, and plan for treatment generalization across settings (Sheridan & Kratochwill, 1992). Thus, involving parents in the problem-solving process and facilitating partnerships between families and schools through a conjoint consultation model leads to meaningful outcomes for children.

CBC is an efficacious model of consultation that has been studied with methodological rigor and shown to result in significant behavior change and positive outcomes for families and schools (Guli, 2005). The Division 16 Task Force on Evidence-based Interventions in School Psychology developed rigorous criteria to determine interventions that are supported by empirical research (Kratochwill & Callan-Stoiber, 2002). CBC was demonstrated to hold promise as an evidence-based consultation model and to produce significant school-related outcomes (Guli, 2005). Other studies validated the effectiveness of CBC (Colton & Sheridan, 1998; Illsley & Sladeczek, 2001; Kratochwill, Elliott, Loitz, Sladeczek, & Carlson, 2003; Sheridan et al.,

2001; Wilkinson, 2005). Additional models of parent consultation that resulted in positive outcomes for children (i.e., joint consultation with differential reinforcement, school consultation with parents and teachers, collaborative consultation, interventions or training with supplemental parent consult) are similar to CBC in that they also involved *both* families and schools in the process (Guli, 2005). However, CBC has been shown to be superior to other forms of treatment such as teacher consultation alone (Sheridan, Kratochwill, & Elliott, 1990) and parent behavioral consultation with a reward component (Laseski, Olympia, Clark, Jenson & Tuesday Heathfield, 2008).

Treatment outcome research reviews and meta-analyses have demonstrated CBC to be effective in applied settings with parents and teachers of children with disruptive behavior. One review investigated the outcomes of 52 CBC cases (Sheridan et al., 2001). Outcomes were measured by direct behavioral observations and social validity data. In addition, the effects of age, case complexity, and symptom severity were examined. Specifically for children with disruptive behavior, CBC was shown to be effective with children who were diagnosed with ADHD and social skill deficits (Colton & Sheridan, 1998). Moreover, consultees found the process acceptable and effective and they reported being highly satisfied with consultants. Effect sizes for all students ranged from 1.08 to 1.11 ( $M = 1.10$ ,  $SD = 1.07$ ). High effect sizes were reported for cases involving older clients with less severe symptoms and younger clients with more severe symptoms. This review of CBC research demonstrated that CBC is an effective model of service delivery for a variety of children, including children with disruptive behavior concerns.

CBC as a service delivery model for children with behavior problems has been investigated mostly through single subject research designs. One investigation examined

the effect of CBC with three boys (ages 8 and 9) with ADHD and social skill deficits (Colton & Sheridan, 1998). Outcome data included direct observation data, social skill rating scales, and measures of treatment acceptability, treatment integrity, and social validity. Interventions focused on improving appropriate and positive play behaviors for each child and included such strategies as (a) self-monitoring, (b) coaching and role-playing, (c) positive reinforcement, and (d) a home-school communication system. Results indicated improvements in social skills from pre-treatment to post-treatment for all three children at home and school. Overall, the children exhibited positive interactions with peers 27% of the time before treatment and 61% after treatment. Consultee and client acceptability reports showed CBC to be acceptable to the parents, teachers, and clients. Integrity of CBC and the social skills interventions, as well as social validity measures, indicated favorable results. In sum, CBC appears to be an effective and acceptable model for improving children's social skills in the home and school setting.

Another small n investigation studied the effectiveness of CBC to meet the needs of children with behavioral concerns in mainstream classrooms (Wilkinson, 2005). A nonconcurrent multiple baseline design along with a follow-up phase was used to measure the effectiveness of a self-management intervention within a CBC model. Participants were two male students identified as having a behavioral disorder in grades 4 and 5. Outcomes were evaluated through direct observations and behavior ratings. Treatment acceptability and consultant effectiveness were also measured. Observations indicated that a positive behavior trend was evident by visual analysis with 100% nonoverlapping data points. The children increased on-task and compliant behavior by 60% and 68% at school. Follow-up observations indicated continued improvements when



compared to baseline data. Results of behavior checklists showed statistically reliable change in behavior from pre- to post-treatment. Parents and teachers reported satisfaction with the CBC process and viewed CBC as acceptable and effective. The study demonstrated that CBC and the behavior intervention (self-management) were associated with improvements in behavior within a mainstream school setting and provided preliminary evidence that CBC is effective at increasing positive child behavior.

CBC may also be an effective mode of service for children who are required to be compliant with medical regimens. One study demonstrated CBC to be more effective than behavioral parent consultation with children who exhibit behavior problems and are diagnosed with Type I insulin dependent diabetes (Laseski, Olympia, Clark, Jenson, & Tuesday Heathfield, 2008). A controlled small-N study explored the effectiveness of CBC in assisting children with diabetes in managing and adhering to medical regimens. The study investigated the effectiveness of behavioral consultation and CBC to reduce uncontrolled blood glucose levels and improve medical adherence. Participants were randomly assigned to a behavioral consultation plus intermittent reward procedure or CBC plus intermittent reward procedure. The reward procedure was used to reinforce target behaviors related to medical treatment adherence. Participants included four patients' aged 8 to 12 years with type I insulin dependent diabetes mellitus. Two of the four patients were diagnosed with ADHD, one exhibited behavior problems at home, and all four were noncompliant with following medical regimens. Results indicated all four participants showed improved compliance to medical regimens and reduced blood glucose levels, with participants in the CBC condition reporting slightly greater improvements. At follow-up, 3 of the 4 participants maintained improved adherence to

medical regimens. When children with behavior problems have the additional stress of following medical regimens, CBC can be effective at not only improving adherence to medical interventions, but also at improving health factors.

CBC has shown to be effective with children who have ADHD, social skills deficits, and other disruptive behaviors within the elementary school and home setting. However, there are few studies investigating the effectiveness of CBC with children who exhibit severe behavior problems or conduct problems. One of these few studies explored the effectiveness of CBC for 5 children (ages 3-6 years) with conduct problems (Illsley & Sladeczek, 2001). The study also investigated how parental ability, parental knowledge of behavior principles, and parent-child interactions influenced consultation outcomes for five cases. Results suggested that CBC was effective in producing positive outcomes at home for children with conduct problems; however, all parents varied in their knowledge, skill, and interactions with their children (Illsley & Sladeczek, 2001). Further research must be conducted to understand the effectiveness of CBC with children who exhibit conduct problems and to explore the influence of parental knowledge and skills on CBC treatment outcomes.

Little research exists that examines the outcomes of CBC using a methodological approach other than a small n design. The only experimental controlled study that has been published investigated the effectiveness of CBC with a manual and videotaped training procedure (Kratochwill, Elliott, Loitz, Sladeczek, & Carlson, 2003). Participants were 125 children identified as having significant behavior problems in preschool, Head-Start programs. The experimental group involved 68 participants; 62 had primarily externalizing concerns including aggression or noncompliant behavior. The control group

involved 21 students after accounting for attrition. Children in the control group were referred to alternative services in the community. The experimental group received conjoint behavioral consultation along with treatment consisting of a manual-based approach or a videotape series on parenting techniques. Conjoint behavioral consultation structured interviews were conducted at the problem identification and treatment evaluation phases and the manual or videotape treatments were introduced and implemented during the plan analysis and plan implementation phases. Outcome measures included direct behavior observations, behavior and social skills rating scales, goal attainment scales, treatment integrity checklists, and a consultation service questionnaire which were all completed by parents and teachers. Treatment acceptability and social validity of the study was examined using a multivariate analysis of variance (MANOVA) and analysis of variance (ANCOVA). Results indicated high levels of treatment acceptability and satisfaction with the manual and videotaped treatment programs and CBC. Treatment integrity results were reported descriptively and the relationship between integrity and effect sizes was explored. Families and teachers reported moderate to high levels of treatment integrity. Pearson correlation coefficients between parent integrity adherence scores and effect sizes were low ( $r = .15$  to  $.28$ ); however, case study analyses indicated a teacher reporting positive child outcomes, reported high integrity, whereas a teacher who reported low intervention integrity also reported poor child outcomes. Treatment effectiveness was evaluated using single-case and between-group research designs. Specifically, behavior and social skills rating scales' pre- and post- tests were analyzed using a multivariate analysis of covariance (MANCOVA), goal attainment scale pre- and post- scores were examined using a

MANOVA approach, and effect sizes were calculated for direct observation data. In addition, single-case research designs were used and reliability of change indices calculated. Direct behavioral observations (i.e., effect sizes) did not show large behavior change and large group analyses of behavioral rating scales (i.e., experimental-control group design and pre-post evaluations) did not show significant improvements in behavior. However, single case analyses results indicated parents reported a reliable change in child behavior in both treatment groups above and beyond the control group. Teachers reported only a slight difference between groups. Moreover, when using behavioral observation data and goal attainment scale data, goal attainment scales indicated that children met their behavioral goals. At home 75% of children from the manual group and 96% in the videotape group met their goals. At school, 60% of teachers in the manual group and 73% of teachers in the video intervention group reported progress. This study showed modest results for children with behavior concerns when videotaped and manualized behavioral treatments are facilitated by CBC and the study was one of the first group design studies to investigate the effectiveness of CBC. Further experimental randomized controlled studies are needed in consultation research.

CBC results in positive outcomes for children with disruptive behavior concerns (Finn, 2003; Myers, 1997; Wilkinson, 2005) and these children typically live in families that experience high stress related to many variables (Frick, 1994; Suarez & Baker, 1997; Webster-Stratton, 1990). Despite this knowledge, few studies have explored the influence of family characteristics such as parenting stress or parenting practices, on the effectiveness of CBC. One study examined the effectiveness of CBC with children with and without diversity characteristics (Sheridan, Eagle, & Doll, 2006). Participants were

125 students and CBC focused on various target behaviors. This study did not involve only students with disruptive behavior, but it is one of the first studies to investigate the effectiveness of CBC with diverse clients. Diversity variables included ethnicity, socioeconomic status, family composition, maternal education level, and language spoken in the home. Data were collected across 8 years of CBC case studies. Results indicated that interventions facilitated by CBC were effective for diverse and nondiverse children alike. Thus, this study suggested CBC may be effective with diverse families who most likely experience parenting stress, much like families whose children exhibit disruptive behavior. Further research is necessary in this area to examine the family and school conditions needed for successful behavior change during consultation.

*Mediators and moderators of behavior consultation and outcomes.* Treatment outcome research and research investigating the influential variables of treatment outcomes are needed in consultation research to understand why, how, and for whom treatment is effective. Furthermore, since families play a role in the development of behavior problems, studies must try to understand how family-related variables influence treatment outcomes for children with disruptive behavior concerns. However, few studies have examined predictors, moderators, or mediators of consultation treatment (Brestan & Eyberg, 1998). Little to no research has been conducted aiming to answer the question, what variables influence the relationship between treatment and behavior outcomes? Investigators can turn to similar research for possible influential variables on treatment outcomes. For example, research in behavioral parent training suggests that family context variables (e.g., SES of the family, family educational level, family stress, and parenting practices) moderate and mediate treatment outcomes when families participate

in such indirect service. Future consultation research must investigate mediators and moderators of treatment outcomes. The current study's research questions and hypotheses drew from behavioral parent training and other family-oriented intervention literature. The family context variables were predicted to be moderators or a partial mediator in the current study's conceptual model because the literature suggests multiple family context variables play a role in family-oriented treatment outcomes.

### *Treatment Implementation Integrity*

In health care fields, treatment implementation integrity is stressed as an important component of treatment that may play an influential role on treatment outcomes. Therefore, just as the family stress or parenting practices may influence how effective treatment is, the degree to which families follow through with implementing interventions as planned, may also impact outcomes. In the current literature base, there are many definitions of treatment integrity, many terms used to represent the topic of treatment integrity (e.g., fidelity), and various methods of measuring the construct.

Behavioral consultation researchers have rarely examined treatment integrity (Maughan et al., 2005; Sheridan, Welch et al., 1996) and thus, when reviewing the literature, research from other health related fields will be discussed. For example, literature from psychotherapy, behavior therapy, social work, behavioral health, and medicine will be reviewed due to these fields' extant literature bases on such topics as treatment/medication adherence, treatment compliance, and treatment integrity/fidelity. Treatment integrity or adherence to treatment has been found to be low for medical treatment plans, medication regimens, psychotherapy and behavior therapy treatment plans, and therapy homework assignments (Levensky & O'Donohue, 2006). Specific to

psychology, it is estimated that about 50% of families receiving psychological services do not follow through with treatment plans (Kazdin, 1996).

Treatment implementation integrity is important because it leads to positive and negative consequences for research and practice (Levensky & O'Donohue, 2006; Taffalo, 2000). When a high level of treatment integrity is present, it can be said that the treatment outcomes are due to quality implementation of the treatment plan. Thus, treatment integrity data ensure the internal validity of an experiment as the data can demonstrate that changes in the dependent variables are due to the independent variable.

Consequently, studies that ensure high levels of treatment implementation fidelity facilitate replication (i.e., establish external validity), and allow for the testing of construct validity (i.e., the explanation of the causal relationship; Schlosser, 2002).

Without evidence of treatment integrity, it is difficult to attribute outcomes to the treatment or components of treatment (Taffalo, 2000). Additionally, nonadherence to treatment may lead to health, social, and financial costs. For example, the patient's health problem may worsen and the health care provider may not be able to accurately evaluate the effectiveness of treatment thus altering the treatment plan. Patients may then have to pay for additional services including appointments, assessments, treatments, and evaluations (Levensky & O'Donohue, 2006). Therefore, to insure cost-effective services, it is crucial to measure treatment implementation integrity.

#### *The Relationship between Integrity and Psychological Treatment Outcomes*

Psychological research measuring treatment integrity has linked treatment integrity to outcomes, yet less than half of the studies report or measure integrity (Hagermoser Sanetti & Kratochwill, 2008; Pereplechikova & Kazdin, 2005). Literature

reviews of treatment integrity research have been conducted in the child psychology literature. Peterson, Homer, and Wonderlich (1982) conducted the first review of treatment integrity literature with studies in the *Journal of Applied Behavior Analysis* between 1968 and 1980. Only 20% of the 539 studies reviewed reported treatment integrity data. Another review extended Peterson et al.'s findings to include studies in the *Journal of Applied Behavior Analysis* within the years 1980 to 1990 (Gresham, Gansle, & Noell, 1993a). Only 15.8% of the 158 studies reported integrity, which represented a decrease from the previous examination. Moncher and Prinz (1991) reviewed research in various treatment orientations in the area of clinical psychology and found similar results. Out of 359 studies reviewed, 55% did not mention treatment integrity in the article. Gresham et al. (1993b) reviewed 181 school-based behavioral intervention studies from 1980 to 1990. Astonishingly, 75% of the studies did not measure, report, or monitor treatment integrity. In the studies that did report integrity, a moderate relationship between treatment integrity of behaviorally-based school interventions and intervention effect sizes was found ( $r = .51$ ). The review was one of the first to demonstrate that the level of treatment integrity is related to the degree of behavior change. A follow-up review of treatment integrity of 152 school-based intervention studies from 1991 to 2005 was conducted and found only 30% of studies provided treatment integrity data (McIntyre, Gresham, DiGennaro, & Reed, 2007). The follow-up review demonstrated a 5% increase in studies presenting treatment integrity data since 1990. In sum, treatment integrity was practically ignored in the years prior to 2005 even though significant relationships between integrity and positive outcomes have been demonstrated.



In the 1990's and 2000's studies have increasingly begun to measure integrity and report relationships between integrity and outcomes. In a therapy setting, when therapists adhere to treatment components, positive outcomes for children and youth are more likely to occur (Perepletchikova & Kazdin, 2005). For example, in one study high levels of adherence to Multisystemic Therapy principles predicted lower rates of arrests, and lower probability of incarceration with a population of adolescents (Henggeler, Melton, Brondino, Scherer, & Hanley, 1997). With a clinical sample of patients with bipolar disorder, provider adherence to a treatment algorithm (i.e., treatment integrity) was associated with larger decreases in overall psychiatric symptoms and depressive symptoms (Dennehy, Suppes, Rush, Miller, Trivedi, Crismon et al., 2005). In school settings, relationships between high levels of integrity (i.e., adherence) and improved outcomes have also been reported through self-reports, direct observations, and permanent products. In a middle school, when school staff adhered to positive behavior support procedures, reductions in problem behavior resulted and academic performance improved (Lassen, Steele, & Sailor, 2006).

*Measurement of treatment implementation integrity in consultation.* Measuring treatment integrity in behavioral consultation allows researchers and practitioners to infer consultation outcomes are due to the behavioral interventions implemented by consultees (Cordray & Pion, 2006). Despite this importance, only approximately 20% of consultation studies examine both outcomes and treatment implementation integrity (Hagermoser Sanetti & Kratochwill, 2008). Studies may lack integrity data because the task of measuring treatment implementation integrity within consultation is complex.

Consultation is an indirect service delivery model which entails two levels of intervention implementation and thus two forms of treatment integrity. *Procedural integrity* is the extent to which the consultant meets the pertinent objectives of the consultation process (Noell, 2008). *Treatment implementation integrity or intervention implementation integrity* (i.e., the focus of the current study) is defined as the degree to which parents, teachers, or other consultees implement the intervention developed within consultation as intended or designed (Noell, 2008). Measuring treatment implementation integrity within a consultation framework is challenging because it is a difficult construct for consultants and researchers to define and control. One reason being the behavioral intervention plan is controlled by an intermediate person, the consultee.

Lack of control is only one reason for lack of integrity measurement in consultation research; consultation researchers have not agreed upon a standardized, systematic procedure for measuring treatment implementation integrity. The most common form of treatment implementation integrity assessed is adherence to intervention plans; however, few measures are available to assess adherence. Three methods for measuring adherence to interventions are common: (a) self-report (Colton & Sheridan, 1998), (b) permanent products (Mortenson & Witt, 1998), and (c) direct observations (Jones, Wickstrom, & Friman, 1997).

The most common form of measuring intervention implementation integrity is self-report. *Self-report measures* assess adherence as perceived by consultees through an intervention-specific checklist of critical intervention components. Self-report measures are considered simple, feasible, and useful for providing performance feedback to consultees; however, some researchers state consultees over-estimate implementation

integrity on self-report measures (Sanetti & Kratochwill, 2008; Wickstrom, Jones, LaFleur, & Witt, J. C., 1998).

*Permanent products* are used to assess intervention implementation via tangible evidence generated on intervention records or protocols. Permanent products are simple much like self-reports, but are more naturally completed as part of the intervention, thus providing important information about intervention implementation integrity not available through self-reports. One limitation to permanent product measures is not every intervention naturally results in a permanent product (e.g., use effective praise).

Lastly, *direct observations* are the least commonly used method to assess intervention implementation integrity. Direct observations involve a trained and reliable individual assessing direct implementation of treatment plan components in naturalistic settings. This method is objective and captures many intervention components; however, it is resource-intensive and requires observers to conduct multiple observations in order to capture numerous intervention components. Observations may also produce reactivity among teachers and parents implementing the intervention. With this knowledge, a multimethod approach to assessment is recommended (Noell, 2008).

Consultation researchers have yet to accept a clear definition of treatment implementation integrity and various dimensions of integrity have been identified (e.g., adherence, dosage; Dane & Schneider, 1998). Dane and Schneider (1998) specified five dimensions of integrity: (a) *adherence*—the degree to which the plan is delivered as designed, (b) *duration*—the length of intervention, (c) *quality of delivery of intervention*, (d) *participant responsiveness*, and (e) *program differentiation*—critical features that differentiate an intervention from a control condition. For example, when treating a child

with a disruptive behavior problem using a consultation model, a prescribed list of steps form a behavior plan which is given to the parents or teachers to implement. Adherence is the percentage of plan steps followed by parents or teachers.

Few consultation studies measure multiple dimensions of treatment integrity and the majority only measure adherence to intervention plans. Empirical evidence highlights the effect of engagement on child outcomes and possible ceiling effects with adherence data. This evidence supports the use of a multidimensional approach to measuring integrity in consultation. Measuring multiple dimensions may be important for understanding the unique difference between various dimensions of integrity, for making clear inferences between integrity and outcomes, and for handling methodological problems (e.g., one integrity dimension measure yields unusable data). For example, a previous study using preliminary data from the “CBC in the Early Grades” study found a lack of variability in adherence to intervention plan scores and identified a sixth dimension of intervention implementation integrity (i.e., *full engagement in the intervention implementation phase*; Swanger-Gagné et al., 2007). Parent report of *full engagement in the CBC intervention or plan implementation phase* included three components: self-monitoring adherence to intervention steps, recording or documenting completion of steps, and submitting integrity forms for review to consultants or during CBC meetings. Specifically, families varied in the percentage of days they self-monitored, documented integrity, and returned integrity measures to research assistants (i.e., defined by Swanger-Gagné et al. as *engagement in the intervention implementation phase*) but demonstrated little variability in the degree to which they reported adherence to implementing plan steps as indicated on self-report forms and permanent products that

were submitted. Thus, adherence was not a sensitive or differentiating measure of integrity, yet a measure of full engagement appeared more variable and sensitive.

The concept of full engagement in the intervention implementation phase has been discussed in previous literature, but never classified as a specific dimension of integrity. Engagement as evident by self-monitoring and self-recording adherence to intervention plans is important to intervention success. When stakeholders fully engage in the intervention implementation phase (i.e., self-monitor and self-record follow-through with implementing a child's intervention and submit integrity forms), integrity improves and is related to the child's behavior changes, confirming the importance of measuring consultee engagement to the intervention implementation phase (Hagermoser Sanetti & Kratochwill, 2009; Petscher & Bailey, 2006; Richman et al., 1988).

Treatment implementation integrity is difficult for consultants and researchers to control and measure, yet it appears crucial to child success (Gresham, 1989; Noell, 2008). The degree and quality with which consultees adhere to treatment procedures affects a child's behavior. For example, in one study general education teachers implemented an academic intervention with four students (Witt, Noell, LaFleur, & Mortenson, 1997). All students improved their academic performance and further improvements were evident for 3 of the 4 students when teachers enhanced treatment integrity. In a later study, treatment integrity was found to be moderately correlated with successful outcomes for children, such as reduced disruptive behavior or improved academic performance when consultants provided feedback to teachers about the integrity in which they were implementing the intervention (Noell et al., 2005). McDougal, Nastasi, and Chafouleas (2005) studied the effectiveness of behavioral consultation and behavioral

interventions for children with behavioral concerns in a school setting. Results indicated that improvements in behavior occurred for 75% of the 16 students; however, this success only occurred when the behavioral interventions were implemented by the teacher with at least moderate intervention implementation integrity (i.e., 70% of intervention steps implemented). Treatment implementation integrity appears to be important to help children succeed in the classroom.

*Experimental manipulations of integrity.* The degree of intervention integrity needed to produce positive treatment outcomes is unknown. Thus, current studies have begun to investigate the effects of (a) experimentally altering the level of intervention integrity across students, classrooms, or days; and (b) assigning groups to interventions at various integrity levels. Results of such studies are inconsistent and use small n research designs.

Most studies investigating the impact treatment integrity manipulations involve teachers implementing the treatment at various levels of integrity within the classroom. One study examined the effects of classwide peer tutoring at various levels of teacher implementation integrity (Greenwood, Terry, Arreaga-Mayer, & Finney, 1992). Results indicated that when teachers implemented the peer tutoring intervention at various levels, the students' responses changed accordingly. When the teachers failed to implement the tutoring sessions as designed or with less integrity, the probability of success decreased. A later study explored the effectiveness of an instructional procedure at high and low integrity levels when teaching preschool children with developmental delays to identify photographs (Holcombe, Wolery, & Snyder, 1994). Six students were instructed at both the high and low integrity instruction levels. Four of the six children learned more

efficiently and at the mastery level when receiving the high integrity level instruction. One child learned equally well under both conditions. Another study investigated the effectiveness of math instruction at various levels of integrity with six children in second grade (Noell, Gresham, & Gansle, 2002). The instruction consisted of prompts to use a counting strategy, accuracy feedback, and intermittent praise. The instruction was presented with 100% integrity, 67% integrity, and 33% integrity. When children received the intervention with higher levels of integrity, children improved their math completion and accuracy.

Other studies have investigated the effect of altering integrity levels of behavioral treatments administered by researchers. For example, a time-out intervention was systematically implemented at 25%, 50%, 75%, and 100% integrity levels with a preschool child who exhibited aggressive behavior (Rhymer, Evans-Hampton, McCurdy, & Watson, 2002). An alternating treatment design was used. The percent of time periods with hitting decreased most when the child received the time-out intervention with 75% and 100% integrity. Next, Wilder, Atwell, and Wine (2006) expanded the literature by testing the effects of a prompting intervention for noncompliance at three levels of integrity with two preschool children. Results demonstrated that compliance rates varied along with integrity levels. When the intervention was implemented with 100% integrity, compliance improved the most, at 50% integrity compliance improved somewhat, and at 0% integrity compliance decreased. The results of these studies systematically investigated various treatments at different levels of integrity and suggested that high levels of integrity lead to improved outcomes for children with disabilities.

One study investigated the effects of intervention integrity on social skills when students were assigned to social skills training groups whereby the intervention was implemented at various levels of integrity (McEvoy, Shores, Wehby, Johnson, & Fox, 1990). Special education teachers taught social skills to 48 students with moderate and severe disabilities using a social integration treatment approach. The authors compared the outcomes of the group of students receiving the treatment at the highest levels of integrity (i.e., one-third of students) to the group of students receiving the treatment with the lowest levels of integrity (i.e., one-third of students). The students receiving the treatment with high integrity showed more improvements in social skills.

In sum, studies that alter the level of integrity with which an intervention is implemented or compare groups that receive interventions conducted at different levels of integrity demonstrate that when treatments are put in place at higher levels of integrity, children respond more favorably to the intervention. This response is evident for academic, behavioral, and social skills interventions. However, some studies have shown no relationship between high levels of integrity and improved outcomes (Gansle & McMahon, 1997; Northup, Fisher, Kahang, Harell, & Kurtz, 1997). Thus, research in this area is inconsistent and future research needs to strive to understand the impact of different levels of integrity on treatment outcomes.

*Summary of relationship between integrity and outcomes.* After reviewing the literature in the area of treatment integrity across multiple health related fields, it is evident that measuring and reporting treatment integrity is pertinent to strengthen research and practice. Furthermore, the literature in psychology, including research in the area of behavioral consultation, has found support for a relationship between treatment



integrity and outcomes in the therapy and school setting. It is hypothesized that efficacious interventions such as CBC are only effective if the parents and teachers implement the interventions designed in consultation; however, this possible mediator role of integrity has not been tested. The link between treatment integrity and treatment outcomes is inconsistent and further research is needed.

Future research in the area of behavioral consultation must measure and report treatment integrity of the behavioral interventions implemented by parents and teachers. A multidimensional and multimethod approach to measuring treatment implementation integrity is used inconsistently in consultation research. Moreover, few to no studies report the integrity in which parents implement interventions with integrity and no studies were found in the area of behavioral consultation that investigate the relationship between home intervention implementation outcomes and treatment outcomes in the home. Treatment integrity is also rarely examined as a mediator or moderator between treatment and treatment outcomes, and no research has examined the home environment as a predictor of home intervention implementation integrity. Virtually no efficacy or effectiveness education intervention studies measure integrity; if integrity is measured it is rarely related to outcomes (O'Donnell, 2008). The current study addressed these needs by examining the mediational role of two dimensions of home treatment implementation integrity (i.e., adherence and full engagement) in the relationship between parenting stress and change in child behavior at home during CBC as measured in a large-scale study. A mediational role was examined because it was hypothesized that the level in which a family adheres to intervention plans and engages in the intervention process explains how and why parenting stress predicts child outcomes during CBC. In other

words, it was predicted that parenting stress indirectly affects child behavior during an intervention by directly impacting the integrity with which they can implement the intervention.

### *The Relationship between Family Context and Integrity*

Research investigating the predictors of treatment integrity has been conducted in various fields of study; however, few studies have examined the family context specifically as a predictor. Some researchers have noted that the implementation of treatment plans is influenced by the “events in the real world” that include factors such as stress, finances, education level, and maybe even parenting skills (Cordray & Pion, 2006). For example, studies in health care fields have demonstrated that lack of resources (e.g., financial, time, social support) and stressful events are associated with low treatment program adherence (Levensky & O’Donohue, 2006; Mellins, Kang, Cheng-Shiun, Havens, & Chesney, 2004). Specifically when children are clients, the parent’s or teacher’s adherence to the treatment plan is related to the availability of economic and social resources (Watson, Foster, & Friman, 2006).

Family adherence to treatment has been studied in the behavioral medicine field. Family relationships, communication, and conflict have been found to influence a family’s level of treatment integrity with Asthma medical regimens especially when the child has high levels of behavior problems (Christiaanse, Lavigne, & Lerner, 1989). In one study, parenting stress, lack of resources, and stressful circumstances were predictors of medication nonadherence for HIV medication (Mellins et al., 2003). Additionally, education level of the treatment agent (e.g., child, parent, and teacher) has been linked to treatment integrity. People with less education implement the treatment with less

integrity; however, the correlation is usually small (Cleary, Matzke, Lexander, & Joy, 1995 as cited in Rains, Lipchik, & Penzien, 2006).

In the field of behavioral consultation, little is known about the extent to which teachers and parents implement interventions and even less about variables (e.g., barriers) that predict intervention implementation integrity (Noell, 2008). Some research has shown teacher characteristics, such as attitude toward education and the intervention, to be related to intervention implementation integrity, but it is unknown if similar family characteristics affect home intervention implementation integrity (Dusenbury, Brannigan, Falco, & Hansen, 2003). Barriers that may impede treatment integrity have been reported, but these barriers all involve consultant variables or skills. For example, the degree of directiveness and level of performance feedback given by a consultant may influence the extent to which parents and teachers implement the intervention developed during consultation. It is unknown if family contexts or characteristics influence the degree to which parents implement an intervention as planned. The current study examined the relationship between parenting stress and treatment implementation integrity.

### *Summary*

Families play a large role in the healthy development of children and the development of disruptive behavior. Thus, outcomes of interventions involving families have been investigated. Family interventions in general have been shown to consistently improve child and family functioning for families of children with disruptive behavior disorders (Estrada & Pinsof, 1995; Serketich & Dumas, 1996). For example, behavioral parent training and conjoint behavioral consultation have demonstrated their effectiveness at reducing behavior problems in home and school settings as well as

changing teachers' and parents' behaviors, knowledge, attitudes, and perceptions (Kratochwill & Bergan, 1990; Maughan et al., 2005).

Interventions including a parent or family intervention along with a child-focused and a school intervention have demonstrated superior results when compared to single component interventions (Valdez et al., 2005). Conjoint behavioral consultation, which links the home and school setting, is considered to lead to the greatest benefits for children and families when compared to other consultation models (Guli, 2005; Kratochwill et al., 2002). Despite its wide range of application, acceptability, and efficacy, CBC is not effective at reducing behavioral concerns and promoting positive parenting practices with *all* families and children. Practitioners and researchers alike do not know which families respond most favorably to CBC and in what capacity these families benefit. Little is known about the families that do not respond to treatment and clinicians therefore do not know how to alter interventions to meet nonresponder's needs (Estrada & Pinsof, 1995). Consultation research needs to begin to investigate moderator and mediator roles in the relationship between consultation and outcomes. It is imperative that practitioners understand what variables may influence the services they deliver and for whom they may need to modify or intensify the treatment.

Behavioral consultation research can gain information about possible moderators and mediators of treatment outcomes from other literature bases (e.g., behavioral parent training research). Behavioral parent training is another empirically supported service delivery model that involves families in the treatment process. Behavior parent training research has examined the variables that influence outcomes and much of the information from this literature contributed to the conceptualization of the current study. Results of

such studies indicate parenting stress, family SES level, mother education level, and parenting practices as moderators and mediators of parent training child behavior outcomes. These same family characteristics may play a role in the relationship between CBC and child behavior; however, this is an empirically-based question that heretofore has not been investigated. The current study specifically explored the role of parenting stress and parenting practices.

Treatment implementation integrity may also predict child behavior change during CBC and certain families may implement interventions with more integrity than others. Treatment implementation integrity impacts outcomes during treatment as evident in psychological and medical research. However, integrity is rarely measured in consultation research. When it is measured and reported, it is done so in a nonstandardized and inconsistent manner. Moreover, certain families may experience barriers to implementing an intervention with integrity and thus this prediction needs to be explored. For example, a family experiencing high stress may implement interventions with less treatment integrity, which may predict fewer reductions in disruptive behavior during CBC. Particularly, if we identify family variables such as family stress that predict treatment integrity, we may begin to understand what family context variables are related to low intervention implementation integrity. Consultants can then provide additional support to these families throughout the plan implementation phase. Consultant support can be provided through direct training, modeling, and performance feedback. Thus, the current study not only used a multimethod approach to measuring intervention implementation integrity within consultation, it examined the relationship between one family characteristic (i.e., parenting stress), two dimensions of intervention

implementation integrity, and change in child problem behavior at home when families participated in CBC.

A unique aspect of the CBC service delivery model is the effort placed on facilitating partnerships between multiple systems, families and schools. Due to the joining nature of CBC, it is important for researchers to account for the role of both the family and school context. Thus, for the current study, the author developed theoretical multilevel models which allowed for predicted teacher/classroom effects.

### *Research Questions and Hypotheses*

1. Does parenting stress moderate the relationship between conjoint behavioral consultation and change in child problem behavior at home?
  - a) It was hypothesized that when families participate in CBC and experience high levels of parenting stress they will report less reduction in child problem behavior over time as compared to families participating in CBC and reporting lower levels of parenting stress.
  - b) It was hypothesized that when families do not participate in CBC and experience high levels of parenting stress they will report little to no reduction in child problem behavior over time as compared to families not participating in CBC and reporting lower levels of parenting stress..
2. Does parenting stress moderate the relationship between conjoint behavioral consultation and change in positive parenting practices (i.e., parental involvement and positive parenting)?
  - a) It was hypothesized that when families participate in CBC and experience high levels of parenting stress they will report less increase in the use of

positive parenting practices over time as compared to families participating in CBC and reporting lower levels of parenting stress.

- b) It was hypothesized that when families do not participate in CBC and experience high levels of parenting stress they will report little to no increase in use of positive parenting practices over time as compared to families not participating in CBC and reporting lower levels of parenting stress..

3. Does change in positive parenting practices (i.e., parental involvement and positive parenting) partially mediate the relationship between conjoint behavioral consultation and change in problem behavior at home?

- a) It was hypothesized that when families participate in CBC they report more reductions in child problem behavior over time when compared to families who do not participate in CBC.
- b) It was hypothesized that when families participate in CBC they report an increase in the use of positive parenting practices over time.
- c) It was hypothesized that when parents report an increase in the use of positive parenting practices over time, they also report a reduction in child problem behavior at home.
- d) Therefore, it was hypothesized that when families participate in CBC, they report an increase in use of positive parenting practices over time and more positive outcomes (more reductions in problem behavior at home) when compared to families who participate in CBC and do NOT report an increase in the use of positive parenting strategies (unless other mediator variables exist) and when compared to families who do not participate in CBC.

4. Does adherence to behavioral interventions at home mediate the relationship between parenting stress and change in child problem behavior at home?
  - a) It was hypothesized that when families participating in CBC experience high levels of parenting stress they will report less reduction in child problem behavior at home over time when compared to families who report lower levels of parenting stress.
  - b) It was hypothesized that when families participating in CBC report high levels of parenting stress they will report lower levels of adherence to home interventions.
  - c) It was hypothesized that when families participating in CBC report low levels of adherence to interventions, they will report less reduction in child problem behavior at home.
  - d) Therefore, families participating in CBC who experience high levels of stress and low levels of adherence to interventions at home, they will report less reduction in child problem behavior over time.
5. Does parent report of full engagement in the intervention implementation phase at home mediate the relationships between parenting stress and change in child problem behavior at home?
  - a) It was hypothesized that when families participating in CBC experience high levels of parenting stress they will report less reduction in child problem behavior at home over time when compared to families who report lower levels of parenting stress.



- b) It was hypothesized that when families participating in CBC report high levels of parenting stress they will report lower levels of engagement in the intervention implementation phase.
  - c) It was hypothesized that when families participating in CBC report low levels of engagement in the intervention implementation phase, they will report less reduction in child problem behavior at home.
  - d) Therefore, families participating in CBC who experience high levels of stress and low levels of engagement in the intervention implementation phase, they will report less reduction in child problem behavior over time.
6. Does the classroom/teacher significantly affect each model?
- a) It was hypothesized that a significant classroom/teacher effect was present in each model. The author hypothesized children in the same classroom with the same teacher will respond similarly to CBC and home behavioral interventions. Similarly, it was predicted that behavior developed and learned within classrooms and teachers carry over into a child's home.

## CHAPTER 3

### Methods

The current study, “The Influence of the Family Context and Intervention Implementation Integrity on Child Behavior During Conjoint Behavioral Consultation” is an extension of a randomized experimental study, “Evaluation of the Efficacy of CBC for Addressing Disruptive Behaviors of Children At-Risk for Academic Failure” (i.e., “CBC in the Early Grades Project,” Sheridan & Glover, IES grant # R305F050284), a longitudinal study examining the efficacy of CBC with children exhibiting disruptive behavior. The purpose of this study was to explore the influence of the family context (i.e., parenting stress and practices) on change in child behavior during consultation. In addition, this study aimed to further research in the area of treatment integrity by studying the integrity with which home interventions are implemented and the relationships between two dimensions of home intervention integrity (i.e., adherence and engagement), parenting stress and change in child problem behavior. Multilevel structural modeling was used to explore (a) the moderating role of parenting stress on change in child problem behavior at home while receiving or not receiving CBC, (b) the moderating role of parenting stress on the effects of CBC on change in positive parenting practices, (c) the partial mediating role of change in parenting practices on the relationship between CBC and change in child problem behavior at home, (d) the mediating role of adherence to home behavioral interventions in the relationship between parenting stress and change in child problem behavior at home, (e) the mediating role of engagement in the intervention implementation phase on the relationship between parenting stress and

change in child problem behavior at home, and (f) the teacher/classroom effect on the models.

### *Participants and Setting*

The current study involved participants in the “CBC in the Early Grades Project.” The “CBC in the Early Grades Project” is presently taking place in a large public school district and parochial schools in a Midwestern city, and schools of surrounding rural areas. This study included the sample of participants involved in the project during the 2005-2006, 2006-2007 and 2007-2008 academic school years. Participants were 81 teachers, 203 parents, and 203 children in grades kindergarten through third grade across 20 schools. Each classroom had at least two and up to three students participate in the study. To answer the fourth and fifth research questions (Models 2a and 2b), only the participants in the CBC intervention group were used because treatment implementation integrity of interventions developed during CBC was investigated (N= 111 parents and children). Only participants in the CBC intervention group implemented interventions and self-monitored or reported the integrity with which they implemented the interventions.

Teachers, parents (or legal guardians including immediate and extended family members and foster and adoptive parents), and students from diverse backgrounds and socioeconomic levels were invited to participate in the “CBC in the Early Grades Project.” Student’s ages ranged from 5 to 10 years, with a mean age of 6.63 years of age; 77% of the students were male; and 75% were from a white, non-hispanic background. The mean grade of students was 1.35 or approximately first grade. Only 23% of the children were previously diagnosed with a disruptive behavior disorder (i.e., Attention

Deficit Hyperactivity Disorder, Conduct Disorder, and Oppositional Defiant Disorder).

Approximately 16% of children were diagnosed with disorders other than disruptive behavior disorders such as, learning disorders, mood disorders, and anxiety disorders.

The remaining 61% of child participants were reported to have no previous diagnoses.

Eighty six percent of parents characterized themselves as Caucasian. About 52% of parent's reported acquiring less than a college degree with 24.1% of families having more than 5 individuals residing in the household; 29% of families reported meeting poverty criteria, 39% met low income criteria, with 50% of the children received free and reduced lunch at school.

Teachers and consultants formed a less diverse and younger group of professionals. One hundred percent of the participants were of Caucasian, non-Hispanic ethnicity. Teachers ( $N = 81$ ) had approximately 9.9 years of teaching experience and approximately 68% of teachers had a college degree and advanced graduate coursework. The average age of consultants was 25 years and they reported an average 2.6 years of consulting experience. Consultant education level ranged from a bachelors degree (25%) to a masters degree (75%). See Table 1 for demographic information.

Table 1

*Participant Demographic Information (45% control, 55% CBC intervention group)*

	Parent (N=203)	Child (N=203)	Teacher (N=81)	Consultant (N=7)
Gender				
Male	11%	77%	3%	0%
Female	89%	23%	97%	100%
Age				
Mean (SD)	34.79 (7.69)	6.60 (1.15)		25.38 (2.07)
Ethnicity				
Caucasian, non-Hispanic	86.2%	75.1%	100%	100%
African American	4.8%	9.5%		
Bi-Racial	2.6%	9.5%		
Other	6.3%	5.8%		
Income				
Middle-high income	61%			
Low-income	39%			
Diagnoses				
Disruptive Behavior Disorder (DBD)		23%		
Other than DBD		16%		
No Previous Diagnosis		61%		
Years of Experience				
Mean (SD)			9.85 (10.34)	2.63 (1.69)

Students were screened and selected for the project using the Systematic Screening for Behavior Disorders (SSBD) multiple-gate screening procedure (Walker & Severson, 1992) and an additional behavior severity rating scale developed by the “CBC in the Early Grades Project” (Glover, Sheridan, Garbacz, & Witte, 2005; see Appendix A). The SSBD is a psychometrically sound instrument that has been used extensively in research to screen and identify students at risk for experiencing behavioral problems. Good test-retest reliability, internal consistency, interrater reliability, item validity, factorial validity, concurrent validity, item validity, discriminant validity, criterion related validity, predictive validity and construct validity have been demonstrated (Walker & Severson, 1992). A modified two-gate version of the SSBD was used by the “CBC in the Early Grades Project” to identify children. Students also qualified for the project if a teacher rated their behavior severe and in grave need for additional intervention on a behavior severity scale. Thus, a child could participate in the project if he or she was identified as a child who exhibited behavior concerns by the SSBD or the behavior severity scale.

Once the students qualified, two to three students per classroom along with their guardians were selected to participate. Each classroom then was randomly assigned by classroom to one of two groups using the random assignment tactic, flipping of a coin. Classrooms, including the teacher and parents of the three randomly selected students, were randomly assigned to an intervention (*CBC intervention*) group or a control (*traditional support*) group. Participants in the control group received typical student support as is traditionally provided by school personnel, including school psychologists, counselors, and specialists. Participants in the CBC intervention group took part in

conjoint behavioral consultation with a trained consultant for approximately 8 weeks.

Parents and teachers were notified of the group assignment and continued with procedures for the intervention or control group if they consented to participate.

### *Informed Consent*

The “CBC in the Early Grades Project” along with the additional measures used for the “Family Context of Children with Disruptive Behavior Study” were approved by the University of Nebraska’s Institutional Review Board (IRB) under IRB# 2005-04-314 EP. School districts and individual schools were presented information about the “CBC in the Early Grades Project” and approved of the project if their teachers wished to participate and consented to the project. Written informed consent was obtained from teachers and parents who participated. While obtaining consent, participants were informed they could decline participation at any time throughout the course of the study. Teacher consent was obtained prior to parent consent and prior to randomization of classroom assignment to the intervention or control group. Parent consent was obtained prior to randomization in the first year of the study and in the subsequent years parent consent was obtained after randomization. Participants in the “CBC in the Early Grades Project” were participants for the current “Family Context of Children with Disruptive Behavior Study.”

### *Measures*

The measures that assessed child disruptive or problem behavior, family context variables (parenting stress and positive parenting practices), and home intervention implementation integrity (i.e., adherence to intervention steps and engagement in the intervention implementation phase) are described below. All measures, with the

exception of intervention integrity measures, were collected from participants in both the CBC intervention and control group. A description of the measures and psychometric properties of the measures are presented in Table 2.

*Family Information Questionnaire.* The Family Information Questionnaire is a survey developed by the “CBC in the Early Grades Project” research team to gather information about family demographic variables. At the beginning of the “CBC in the Early Grades Project,” informants were asked to complete the Family Information Questionnaire. Items aim to assess child risk factors including: child age, child gender, family and child ethnicity, maternal and paternal education level, family income, number of parents, adults, and children in the home, primary and home language, previous school experience, and whether the child has an identified disability and receives services.



Table 2

*Constructs and Variables Investigated, Measures, and Psychometric Properties*

Construct	Variables	Measures	Psychometric Properties
	Demographic Information	Family Information Questionnaire	No psychometric properties available
Parenting Stress	Total Stress	Parenting Stress Index-The Short Form (PSI-SF; Abidin, 1995)	Internal Consistency: $\alpha=.88$ (current sample); $\alpha=.91$ Test-Retest Reliability: $r=.75$ to $.84$ (Abidin, 1995; Haskett et al., 2006)
Positive Parenting Practices	Involvement and Positive Parenting	Alabama Parenting Questionnaire-Parent Form (APQ; Shelton et al., 1996) involvement and positive parenting subscales	Internal Consistency: parent involvement subscale $\alpha=.75$ ; positive parenting subscale $\alpha=.77$ (Dadds et al., 2003; Shelton et al., 1996); positive parenting practices construct $\alpha=.70$ (current sample)
Home Intervention Implementation Integrity (adherence and full engagement)	Self-report of Integrity	Self –Report Form	No information available about reliability and validity
	Permanent Product	Permanent Product Report Form and Permanent Product Reliability Report Form	Interrater Reliability: $r=.98$ (Swanger-Gagné et al., 2006)
Child Problem Behavior (home)	Parent Report	Parent Daily Report (PDR; Chamberlain & Reid, 1987)	Internal Consistency: $\alpha=.94$ (current sample); Test-Retest Reliability: $\alpha=.85$ to $.98$ ; Interrater Reliability: $r=.98$ (Chamberlain & Reid, 1987)

*Parent Daily Report.* The child's behavior in the home was measured using the Parent Daily Report (PDR; Chamberlain & Reid, 1987). The PDR is a 34-item daily observation and self-report measure that allows for repeated assessments of child problem behaviors before and during intervention. The parent reviews the list of items indicating which, if any, of the behaviors occurred in the last 24 hours. This brief measure was completed 10 times over a 5 to 10 week period. Each daily parent report resulted in a frequency score representing the number of problem behaviors (i.e., externalizing and internalizing behaviors) observed out of the list of 34 behaviors. Next, two summary scores were computed from (a) four reports collected before the behavior intervention was implemented (pre-treatment score), and (b) six reports collected after the intervention was implemented (post-treatment score). The sum of each separate report resulted in a total summary score. Lastly, a change score was calculated by subtracting the pretreatment summary scores from the post-treatment summary score. The change score was used in the analysis. The PDR has test-retest reliability ranging from .85 to .98 and inter-interviewer reliability ( $r = .98$ ). The PDR has also been validated with direct observation of child behavior in the home (Chamberlain & Reid, 1987). Using the current sample, the internal consistency score for the PDR was strong ( $\alpha = .94$ ).

*The Parenting Stress Index-The Short Form.* Parenting stress was assessed using the Parenting Stress Index-Short Form (PSI-SF; Abidin, 1995) which measures parenting stress in 36 items for parents of children 12 years and younger. Results yield a total stress score from three scales: (a) parental distress, (b) parent-child dysfunctional interaction, and (c) difficult child. The three subscales represent the three factors of the PSI-SF that were established after a factor analysis was conducted. Replication studies suggest that

the three-factor structure of the PSI-SF is stable (Reitman, Currier, & Stickle, 2002). A recent study demonstrated support for a two-factor model, indicating one factor comprised of items from the Parent Distress Subscale, and a second factor including items from the Parent-Child Dysfunctional Interaction Subscale and Difficult Child Subscale (Haskett, Ahern, Ward, & Allaire, 2006). The Parental Distress Subscale focuses on the parent's stress related to being a parent such as parenting competence, restrictions placed on a parent, and conflict with partner. Some items include, "I feel trapped by my responsibilities as a parent," and "Having a child has caused more problems than I expected in my relationship with my spouse." The Parent-Child Dysfunctional Interaction (PCDI) subscale measures the parents perceptions' of their child and interactions with their child which may not be reinforcing or meet the parent's expectations. The PCDI subscale includes items such as, "My child rarely does things for me that make me feel good." The third subscale, the Difficult Child Subscale, asks the parent about their child's behavior and temperament with items such as, "My child makes more demands on me than most children." The average baseline scores were used in the analysis of this study.

Good test-retest reliability and internal consistency for the PSI-SF total stress and subscale scores has been demonstrated (Abidin, 1995). Test-retest reliability has been shown with a sample of 270 participants for the total stress and subscale scores (Total Stress,  $r=.84$ ; Parental Distress,  $r=.85$ ; Parent-Child Dysfunctional Interaction,  $r=.68$ ; Difficult Child,  $r=.78$ ). Internal consistency was established with a sample of 800 participants and the coefficient alpha scores were as follows: Total Stress,  $\alpha=.91$ ; Parental Distress,  $\alpha=.87$ ; Parent-Child Dysfunctional Interaction,  $\alpha=.80$ ; Difficult Child,  $\alpha=.85$ .

Using the current sample, the internal consistency score for the PSI-SF was strong ( $\alpha=.88$ ). Moreover, studies confirm the construct validity of the PSI-SF by conducting regression analyses with other similar measures (Haskett et al., 2006; Reitman et al., 2002). Results of the regressions indicated that subscale scores were significantly related to similar scales. Test-retest stability and predictive validity were also evident (Haskett et al., 2006). PSI-SF scores were highly stable over 1 year (Total Stress Score,  $r=.75$ ) and related to parents' reports of disruptive behavior in the home one year later.

*The Alabama Parenting Questionnaire-Parent Form.* Parenting practices were measured by the Alabama Parenting Questionnaire-Parent Form (APQ; Shelton et al., 1996). The APQ is a parent self-report form that consists of 42 items which measure parenting practices on a 5-point likert scale (i.e., never, almost never, sometimes, often, and always). It was developed to measure the specific parenting practices that are associated with risk for conduct problems (Dadds, Maujean, & Fraser, 2003). The APQ was completed by the primary caregiver. It assesses parenting across six areas using six subscales: (a) parental monitoring and supervision, (b) inconsistent punishment, (c) corporal punishment, (d) positive parenting, (e) involvement, and (f) other discipline practices. This study only used the involvement subscale (i.e., items 1, 4, 7, 9, 11, 14, 15, 20, 23, and 26) and the positive parenting subscale (i.e., items 2, 5, 13, 16, 18, and 27). Items in the involvement subscale include statements such as, "You talk to your child about his/her friends," and items in the positive parenting subscale include, "You reward or give something extra to your child for obeying you or behaving well." The summary scores from each subscale were combined to form a positive parenting composite score. The positive parenting practices composite score was the sum of the raw scores on the

positive parenting and involvement subscales. APQ positive parenting change scores were based on the difference between the average post-test scores and the average pre-test scores of the positive parenting composite (sum of positive parenting and involvement subscale scores). As parents report the use of positive parenting more often, their score on the APQ increases; if a parent reported using positive parenting practices more often post-treatment versus pre-treatment, a positive change score results. The change scores were used to represent the change in positive parenting practices variable in the analysis.

Studies suggest that the APQ has good internal consistency for positive parenting, involvement, and inconsistent punishment subscales ( $\alpha > .7$ ) but low to moderate internal consistency for monitoring and supervision and corporal punishment subscales ( $\alpha < .6$ ). The APQ also has good criterion validity and discriminant validity is adequate for all subscales (Shelton et al., 1996). Dadds et al. (2003) used a large community sample and found the APQ to have at least moderate internal consistency across all subscales (parent involvement  $\alpha = .75$ ; positive parenting  $\alpha = .77$ ; inconsistent punishment  $\alpha = .73$ ; monitoring and supervision  $\alpha = .59$ ; corporal punishment  $\alpha = .55$ ). Using the current sample, the internal consistency score for the APQ's two combined subscales (i.e., involvement and positive parenting subscales) was good ( $\alpha = .70$ ) and consistent with other studies who examined the two subscale's reliability with other samples. Test-retest reliability of the APQ has been found to be stable and external validity has been demonstrated when the APQ is correlated with other similar measures (Dadds et al., 2003). One recent study found that parent reports on the APQ were correlated with concurrent parent-child interaction observations (Hawes & Dadds, 2006).

*Home intervention implementation integrity measures.* Two dimensions of home intervention implementation integrity were assessed in this study: parent report of adherence to home behavioral interventions and full engagement in the intervention implementation phase. Both dimensions of integrity were measured using two instruments or methods (i.e., self-report forms and permanent products). First, fidelity criteria (i.e., steps) for each behavioral plan were listed clearly and objectively as a plan summary on the *self-report form* (see Appendix B for a copy of the self-report plan summary form). These checklists have been used in previous research (Sheridan et al., 2001) and were completed by parents daily while the intervention was in place. Each day, parents self-recorded adherence to each step of the plan by indicating “yes” (indicating that the plan step had been completed), “no” (indicating that a plan step was not completed), or “not applicable” (NA; e.g., no occasion to deliver the step, child did not perform required behavior, change in schedule). Steps completed on the self-report form were summed and an average-number of fidelity criteria met was computed based on the total number performed divided by the total number possible, excluding NA responses. All parents in the CBC intervention group were asked to complete intervention self-report forms. If parents did not complete or return the self-report form, the data were not considered for adherence scores, only full engagement scores.

Second, parents collected and submitted *permanent products* from the intervention to verify that steps of the behavior plan were completed (see Appendix B for a sample permanent product). Permanent products were completed by parents in the CBC intervention group daily for the duration of intervention (i.e., at least 4 weeks of intervention). Specifically, charts were collected from parents, on which evidence (e.g.,

stickers, notes, marks, and checks) was recorded, demonstrating they implemented steps of the intervention. The products ultimately served as evidence of intervention implementation. Interventions that used products were home-school notes, progress monitoring forms, positive reinforcement charts, compliance matrices, activity checklists, self-monitoring forms, charts, token economies, and time-out logs. For example, a consultant used a home-school note written by the parent to confirm that the parent completed relevant steps of her home plan for a particular day when concrete evidence was available on the home note (e.g., reward stickers).

*Permanent product report forms* were developed in a manner consistent with the self-report form. First, consultants eliminated intervention steps of the self-report form that were not visible on permanent products to create the permanent product report form. Trained research assistants and consultants reviewed permanent products and completed the permanent product report forms to reflect parents' delivery of plan components as reported on permanent products, just as the parents indicated adherence on the self-report forms. Specifically, coders (i.e., consultants and research assistants) recorded parents' completion of intervention plan components as "yes," "no," or "not applicable." A rating of "yes" indicated that the plan step had been completed, a rating of "no" indicated that a plan step was not completed, and a rating of "not applicable" indicated the step could not be completed (e.g., no occasion to deliver the step, child did not perform required behavior, change in schedule). Steps completed on the report form were summed and an average of steps met was computed based on the total number performed divided by the total number possible, excluding not applicable responses and intervention steps not visible on permanent products (e.g., praise).

Trained graduate assistants completed a *permanent product reliability report form* and the percentage of plan steps completed as evident on the permanent product was calculated. Two graduate assistants completed the permanent product record form and interrater reliability was computed (see Appendix B for a copy of the permanent product record form and the permanent product reliability record form). Past research with these data demonstrated high interrater reliability for permanent product forms in general (ICC=.98; Swanger-Gagné et al., 2007) and for permanent product forms used in home interventions (ICC= .84 and percent exact agreement across raters was 89% exact agreement; Sheridan, Swanger-Gagné, Welch, Kwon, & Garbacz, in press). If integrity of implementation was questioned upon completion of intervention integrity forms, the CBC consultant met with the parent, reviewed the behavior plan steps, and provided feedback on the implementation of the plan to the parent (Noell, 2008).

Two dimensions of integrity were computed in the current study. *Adherence to home behavioral interventions* was operationalized as the average percentage of plan steps completed (across both measures of integrity) as designed in consultation. Total adherence scores of each measure were computed by dividing the total number of behavioral plan steps completed by the total possible number of plan steps, excluding NA responses and data not recorded or returned. Adherence to home behavioral intervention scores were the average of the two measures' (self-report and permanent product measures) total adherence scores on submitted forms. The possible range of average adherence scores was 0 to 1.00 (i.e., 0% to 100%). A score of 100% adherence to the intervention plan indicated a family completed an average 100% of plan steps on the forms they returned to the study graduate assistants. Parent report of *full engagement in*



*the intervention implementation phase* was defined as three components: self-monitoring intervention implementation, recording completion of intervention steps, and returning forms to consultants during the implementation phase. Total engagement scores of each measure were computed by dividing the number of self-monitored, recorded, and submitted plan steps recorded by the total number plan steps possible to record, excluding NA responses. Unlike adherence scores, full engagement scores accounted for adherence data not self-monitored, recorded, or submitted. Full engagement in the intervention implementation phase scores were the average of two measures' (self-report and permanent product measures) total engagement scores. The possible range of average full engagement scores was 0 to 1.00 (i.e., 0% to 100%). A score of 100% engagement in the intervention implementation phase of CBC indicated that a family recorded integrity every day on both measures of integrity *and* submitted the forms to study graduate assistants. Each measure was completed for 4 weeks or between 20 (i.e., weekdays) and 28 days (i.e., full week).

### *Procedures*

The procedures that were used in the “The Influence of the Family Context and Intervention Implementation Integrity on Child Behavior During Conjoint Behavioral Consultation” will be described in greater detail in the following section. Procedures are consistent with the procedures used in the “CBC in the Early Grades Project.”

Specifically, the procedures for CBC implementation in the CBC intervention group, control group procedures, behavior intervention implementation, data collection, and data entry procedures will be discussed.

*CBC implementation.* The CBC intervention group procedures will be explained below. See Table 3 for a representation of the CBC phases and meetings. *Conjoint behavioral consultation*, a structured, indirect model of service delivery was conducted with one teacher and up to three parents (of three separate children within the same classroom). Families and teachers collaboratively addressed student needs with a consultant in a joint problem-solving framework. CBC aims to facilitate and promote partnerships through shared responsibility, a strengths-based orientation, relationship building, and skill building. Participants met with the consultant for approximately four to five conjoint consultation sessions over the course of approximately 8 weeks. Meetings were held in a classroom or home and were approximately an hour in length. Among the meetings constituting the CBC intervention were three interviews: the Conjoint Needs Identification Interview, the Conjoint Needs Analysis Interview, and the Conjoint Plan Evaluation Interview. Some meetings (i.e., treatment implementation phase meeting and conjoint plan evaluation phase meeting) included the consultant, teacher, and parents of all participating students. Other meetings (i.e., preconsultation meetings, conjoint needs identification and analysis meetings, and home-visits during treatment implementation) included only the consultant and teacher or only consultant and one parent. In addition, other meetings/interactions between consultant and consultees included feedback sessions after consultant observation of intervention implementation, home visits, phone contacts, and face-to-face contacts at the school. See Table 3.

Table 3

*Conjoint Behavioral Consultation Phases and the Tasks Included in Each Phase*

Phase	Interview	Meeting Type	Tasks
Preconsultation		Group	Introduce the CBC process Gain consent to participate (years 2 and 3) Discuss confidentiality Distribute and collect demographic forms Distribute pre-treatment rating scales Begin baseline PDR's
Conjoint needs identification and analysis	Conjoint needs identification and analysis interviews	Individual	Identify strengths and needs Prioritize and define target need Identify target setting Complete functional behavior assessment Develop behavioral goals Discuss ways to measure target behavior Complete baseline PDR's
Plan implementation		Group training, Home visits, and school visits	Teach, model, and role-play interventions Observe classroom behavior plan Observe home plan implementation Provide performance feedback Collect intervention integrity data Continue communication with consultees Collect treatment PDR's
Conjoint plan evaluation	Conjoint plan evaluation interview	Group	Discuss progress made toward goals Evaluate plan Discuss next step: change or continue plan Plan for generalization and maintenance Distribute post-treatment rating scales

Preconsultation with parents and teachers occurred before the phases of CBC began. During preconsultation, behavioral consultants introduced consultees to the “CBC in the Early Grades Project.” The CBC phases and data collection procedures were described. Research consent was obtained at this time and confidentiality was discussed. The Family Information Questionnaire (i.e., demographic information form), the PSI, and the APQ were distributed to parents and teachers and demographic information was collected. In addition, the first PDR was completed with parents. Questions were answered and initial information about the child’s strengths and needs were discussed.

During the first formal phase of CBC, the *conjoint needs identification phase*, consultants conducted a Conjoint Needs Identification Interview (CNII). The CNII was conducted separately with each of the two to three families of children within the same teacher’s classroom. The parent and teacher discussed the strengths and needs of each child (i.e., the behavioral challenges that impede learning in the classroom). The challenging behaviors were prioritized and target behaviors were determined for each child in the home and school setting. Methods for building upon the child’s strengths and skills were discussed. A setting and time for intervention were identified. Conjointly, teachers and parents developed shared goals for each child. The consultant then explained the rationale for collecting behavioral data and baseline behavior performance data were discussed.

The second phase of CBC, the *conjoint needs analysis phase*, involved the consultant reviewing the baseline behavior performance data and modifying behavioral goals as necessary with the parents and teachers. The Conjoint Needs Analysis Interview (CNAI) was completed whereby the consultant conducted a functional behavior

assessment by gathering information from the parents and teacher regarding each target behavior and setting. The function of the target behavior was identified and specific goals for each student determined. An empirically-supported intervention linked to the function of the target behavior was developed. This phase was conducted separately with each family and the teacher.

The CNII and CNAI were combined and conducted within a 1 hour meeting. The interviews were condensed into one meeting in attempt to reduce the number of meetings and time commitment of the consultees and increase the practicality of the CBC process. Consultants were required to meet predetermined objectives for each of the CBC interviews. The duration of the conjoint needs identification and analysis phases was approximately 2 weeks. Throughout this time period, the meetings were conducted with each family; baseline target behavior data were collected by families, teachers, and independent observers; intervention plans were discussed and finalized; and continued contact between the consultant and consultees occurred (e.g., classroom observations, phone calls, emails).

The third CBC phase, the *plan/intervention implementation phase* involved the consultant meeting for approximately 1 hour with two to three families and their child's teacher in a group format. This phase also consisted of consultant involvement and observation in the classroom and home visits. During this phase, the parents and teachers received direct instruction by the consultant on evidence-based interventions to reduce disruptive behavior and increase adaptive, prosocial behavior (See following subsection, behavior intervention procedures, for more information). Strategies for reducing excessive disruptive behaviors and increasing alternative behaviors were discussed. The

consultant and consultees reviewed the specific behavior plans discussed in the previous phase. The consultant taught, modeled, coached, and role-played the behavioral plans with the consultees. Opportunities to practice the strategies in the natural environment (i.e., home and school) were provided. Consultants provided feedback and planned for possible barriers to accurate and complete plan implementation. Intervention implementation integrity was documented on self-report plan summary forms and permanent products were completed and collected during this phase. This phase was generally at least 4 weeks.

Finally, during the *conjoint plan evaluation phase*, the intervention plan was evaluated and progress towards goals was discussed. The Conjoint Plan Evaluation Interview (CPEI) was completed during a 1 hour group meeting involving the classroom teacher and the two to three families participating. The consultant evaluated and graphed data collected by the teachers and parents. Student treatment outcomes were compared to baseline levels of performance and behavioral goals. Parents, teachers, and the consultant jointly decided whether to continue the behavior plan or to modify the plan depending on data documenting progress towards a goal. Termination, generalization, fading of interventions, and maintenance of behavioral outcomes were discussed.

*Behavior intervention procedures.* Behavioral interventions were implemented during the conjoint plan implementation phase and intervention implementation integrity is measured during this time. The behavioral interventions began after the group meeting occurred and continued for at least 4 weeks. Behavioral interventions consisted of three standard components. First, a communication component involved a system of regular contact (e.g., home/school note, scheduled email, regular phone calls) between home and

school, consistent with the philosophy of CBC. This system was established to relay information about the child's behavior (e.g., progress toward goal, rewards earned). Second, a motivation component was included to increase positive behaviors or preferred behaviors or decrease problem or disruptive behaviors. Rewards for desired behavior were delivered in a specified format (e.g., grab bag, spinner, chart move, behavior contract). Third, a functional component was included in the intervention. After the functional assessment was completed and a hypothesized function determined (i.e., attention, escape, avoidance, sensory stimulation, skill), an intervention to address the function of the undesired behavior was implemented (e.g., if attention is the function of interruptions, the teacher may be taught differential attention procedures). Additionally, similar behavioral intervention procedures or steps were standardized across children and used in the development of the intervention implementation integrity measures. Each intervention included between 4 and 12 steps.

*Control group procedures.* Trained graduate assistants contacted parents and teachers of the control group and explained they would receive traditional support by school professionals and would not receive CBC with a consultant from the local university. They were also informed that data in the form of questionnaires and parent report would be collected via phone, email, and mail over the course of approximately 12 weeks (see data collection section for more details). Data were collected from control group participants during the same approximate time frame as intervention group participants' data were collected.

*Data collection.* Various methods of measurement were used to assess child problem behavior, parenting stress, positive parenting practices, and treatment

implementation integrity (i.e., adherence and full engagement dimensions) for participants in both groups. These measures were collected by trained graduate assistants throughout the project. The assistants were research assistants in the “CBC in the Early Grades” Study. Each classroom assigned to the CBC intervention group was matched to a control group classroom with similar characteristics (e.g., grade, school). Research assistants aimed to collect data from both classrooms in each group around the same approximate date.

Participants in both groups completed the Family Information Questionnaire, the PSI, the APQ, and the PDR. These measures were collected by trained graduate assistants from parents participating in the CBC intervention group and in the control group of the “CBC in the Early Grades” Study. The Family Information Questionnaire was collected when family participants entered the study. The PSI and APQ were distributed and collected from parents by the graduate assistants when participants entered the study (pre-test) and again approximately 12 weeks following the completion of the first questionnaire (post-test). The PSI and APQ were only collected in the final two years of the study. The Parent Daily Report was collected in person, via the phone, and by email from caregivers. Trained research assistants asked parents to indicate which of the 34 behaviors occurred over the past 24 hours at home. They collected four reports pre-treatment (i.e., before behavioral intervention is implemented at home) and six reports during the treatment implementation phase within 5 to 10 weeks.

The intervention implementation integrity self-report forms and permanent products used to measure parent report of adherence to the behavioral interventions and full engagement in the intervention implementation phase were completed by only the



CBC intervention group. These instruments were completed by the CBC intervention group only because these participants, and not those in the control group, implemented a home behavioral plan. The self-report form and permanent products were developed by the parent and trained consultant. The self-report form was completed by parents in the CBC intervention group daily during the intervention implementation phase of CBC and collected each week by trained graduate assistants. The permanent products were completed by parents during the intervention phase and collected upon completion of the product. Finally, trained graduate assistants translated the permanent product data onto the permanent product report forms and other graduate assistants completed permanent product reliability report forms to be compared at a later date.

*Data entry.* The data that were collected as part of both the “CBC in the Early Grades” study and the current “Family Context of Children with Disruptive Behavior” were scored and entered into a database. Data entry was completed by trained graduate research assistants. Data entry was checked for accuracy with a random 30% of the participant data.

#### *Experimental Design and Data Analysis*

For the purpose of the larger experimental study, a randomized experimental design was used to evaluate the effect of CBC on student behavior. The teachers and parents from each grade level at each school were randomly assigned by classroom to one of two groups for student support— *traditional support* or *CBC intervention*. Classrooms, including the teacher and parents of the three randomly selected students, were randomly assigned to an intervention (*CBC intervention*) group or a control (*traditional support*)

group (see descriptions of groups above). To answer research questions 4 and 5, only the CBC intervention group was used in the analyses.

A power analysis was conducted for the primary aim of this study, testing the effect of CBC on change in child problem behavior at home. The power analysis made use of the Monte Carlo feature of Mplus version 4.2 (Muthén & Muthén, 2007) for a simulation-based empirical power analysis. Descriptive statistics from pilot data were used as population variance parameters for the variables included in the model. For the parameter of interest, the effect of group (i.e., CBC intervention or control group) on parent report of change in child problem behavior, the population effect size was assumed to be moderate ( $r = .2$ ). This analysis followed the procedures outlined by Muthén and Muthén (2002). The model used to analyze the data implemented MLR estimation (Robust Maximum Likelihood), a method of analyzing results which uses a bootstrapped estimator for the model standard errors to adjust the tests of significance for any possible variation due to clustering. Also, because the analytic model does not directly model the nested structure of the data, a more stringent power criterion of 85% was sought for this study. Assuming the effect size as previously stated (.2) and a standard Type I error rate of  $\alpha = .05$ , a sample size of 240 students yields at least 85% chance to detect significance in the coefficient of interest. In other words, 80 classrooms (240 students) will provide an 85% chance of detecting the parameter of interest (i.e., effect of group), and thus rejecting the null hypothesis that treatment group does not affect change in parent report. Assuming a medium effect size (.3) and a standard Type I error rate of  $\alpha = .05$ , a sample size of 130 students (43 classrooms) yields at least 85% chance of detecting significance in the correlation coefficient. At least 43 classrooms and 130 students must participate to

detect a moderate effect of treatment group on change in child problem behavior. Thus, the current study had adequate power to detect medium effect sizes for the relationship between group and change in child problem behavior as 80 teachers or classrooms and 203 students and parents participated in the current study.

The current study, “The Influence of the Family Context and Intervention Implementation Integrity on Child Behavior During Conjoint Behavioral Consultation” tested the role of family context variables on the treatment outcome and the role of two dimensions of home intervention implementation integrity (i.e., parent report of adherence and full engagement) on the relationship between parenting stress and change in child problem behavior. First, descriptive statistics of the study sample (i.e., age of children, grade, diagnoses, guardian age, ethnic and racial demographics, and family income) and measures (i.e., range of scores, mean scores, and standard deviations) were computed to provide a context for describing the sample. Next, moderators and mediators were examined within the multilevel models. In Model 1, the moderator role of parenting stress was examined with Baron and Kenny’s method of detecting moderation (Baron & Kenny, 1986) and the partial mediator role of change in positive parenting practices was evaluated using a Sobel test (Sobel, 1982). The moderating and mediating roles were evaluated within each of the two groups (i.e., CBC intervention group and traditional support group; see Figure 1). Change in parenting practices was tested as a partial mediator because it was hypothesized that CBC directly affected additional variables not represented in the model, such as home-school collaboration. Sobel tests were also used to test the indirect and mediating roles of two home intervention implementation integrity dimensions on parenting stress and change in child behavior at

home in Models 2a and 2b (see Figures 2 and 3). The specific data analysis plan for each research question is explained in detail below.

Multilevel modeling and path analysis were used to examine the relationships among variables within the models while accounting for the effect of classrooms/teachers on children's behavior. This method of data analysis is supported by theory (e.g., ecological theory) and research. For example, ecological theory emphasizes the important role of multiple contexts or systems and the interactions occurring within and between systems on children's development and behavior (Bronfenbrenner, 1977). Ecological theory has led researchers to develop a data analysis method that considers both individual child differences, unique context differences, and the similarity of children within the same context, multilevel modeling (Bovaird, 2007). In fact, multilevel modeling is sometimes referred to as contextual modeling. Researchers emphasize the need for multilevel modeling when samples are nested and complex. A multilevel model of analysis was appropriate for this study because it allowed for the investigation of the influence of family context variables and intervention integrity dimensions while also taking into account the nesting of students within classrooms. The author hypothesized children in the same classroom with the same teacher would respond similarly to CBC and home behavioral interventions. Similarly, it was predicted that behavior developed and learned within classrooms and teachers would carry over into a child's home. For example, CBC may not be as effective in some classrooms and therefore if it is not effective at school, the intervention may not be as effective in homes. Analysis of the multilevel model was tested with multilevel path analysis using Mplus, version 4 (Muthen & Muthen, 2007). The multilevel models included two levels of analyses: Level

1, child and parent factors and Level 2, classroom or teacher effect (see Appendix C for MLM syntax).

*Research question 1, 2, and 3.* The current study investigated the impact of family context variables (parent stress level and positive parenting practices) on CBC intervention effects (see Table 2 for a list of variables, measures, and psychometric properties). Specifically, it was hypothesized that (a) parenting stress will moderate the relationship between CBC and change in child problem behavior at home, (b) parenting stress will moderate the relationship between CBC and change in positive parenting practices, and (c) change in positive parenting practices will partially mediate the relationship between CBC and change in child problem behavior at home. The presence or absence of CBC served as an indirect predictor variable for child problem behavior. CBC will be coded as present (i.e., 1) or not present (i.e., 0).

Change in child problem behavior at home served as the criterion variable, measured using the Parent Daily Report (PDR; Chamberlain & Reid, 1987). Each daily parent report resulted in a frequency score representing the number of problem behaviors observed out of the list of 34 behaviors. Next, an average score was computed for pre-treatment and post-treatment. Lastly, a change score was calculated by subtracting the pre-treatment average score (i.e., average baseline score) from the post-treatment average score. The change score was used in the analysis.

Parenting stress was tested as a possible moderator of treatment outcomes (i.e., change in positive parenting practices and change in child problem behavior). Parenting stress was assessed using The Parenting Stress Index-Short Form (PSI-SF; Abidin, 1995). The pre-treatment raw score was used to represent the moderator variable. The possible

range of scores was 1 to 5 with 5 indicating high parental stress. The raw score was calculated by averaging all individual raw scores. An average pre-treatment raw score was used instead of a change score because pilot data indicated no change in parenting stress over the course of the study.

Change in positive parenting practices (i.e., involvement and positive parenting) was tested as a possible partial mediator. It was predicted change in positive parenting practices was a partial mediator because literature and research suggests other mediators may play a role in CBC treatment outcomes (e.g., home-school collaboration).

Involvement and positive parenting practices were measured by the Alabama Parenting Questionnaire-Parent Form (APQ; Shelton, et al., 1996). The two subscale scores were added together to create a positive parenting practices sum score or composite. Pre-treatment and post-treatment average composite scores were calculated. Next, change scores (i.e., the difference between post-test average scores and pre-test average scores) were computed and used to represent the positive parenting practices variable in the analysis.

Multilevel model fit was analyzed using multilevel path analysis. The analysis consisted of multiple steps. Direct effects, moderator effects, mediator effect, teacher/classroom effects and overall model fit were evaluated. First, direct effects between variables were evaluated. Direct effects of (a) the CBC intervention on change in positive parenting practices and on change in child problem behavior, (b) change in parenting practices on change in child problem behavior, and (c) parenting stress on change in positive parenting practices and change in child problem behavior were evaluated.

Next, the possible moderator role of parenting stress on treatment outcomes (change in positive parenting practices and change in child problem behavior) was tested to determine if parenting stress influenced the change in child problem behavior and change in positive parenting practices when a family participated in CBC and when they did not. Within a multilevel structural model, moderation was examined by using Baron and Kenny's method of detecting moderation; three causal paths were evaluated (impact of independent variable, impact of moderating variable, and impact of interaction of IV and moderating variable (Baron & Kenny, 1986). In other words, main effects and interaction effects were examined. The immediate effects of the intervention were assessed by examining group differences in child behavior after completion of one year in the project. The immediate effect of parenting stress on outcomes was also examined. The relationship between the presence of CBC and change in child problem behavior scores at different levels of parenting stress and the relationship between CBC and change in positive parenting practices at different levels of parenting stress were compared (i.e., interaction effect). Parenting stress was entered to control for differences in the home environment that may affect CBC intervention response. Strength and significance of main effects and interaction effects were evaluated by examining path coefficients (i.e., beta weights) at .05 *p*-level. See Figure 1 for the Model 1.

The indirect effect and partial mediator role of change in positive parenting practices on CBC outcomes within the multilevel model was tested using a Sobel test (Sobel, 1982). According to MacKinnon and Dwyer (1993) and MacKinnon, Warsi, and Dwyer (1995) mediation occurs when the independent variable affects the dependent variable indirectly by first affecting the mediator which then affects the dependent

variable. A statistically significant and practically significant indirect effect is necessary for mediation. In order for mediation to occur, the effect of CBC on change in child problem behavior must significantly decrease upon addition of the mediator (i.e., change in positive parenting practices) to the model. Mediation or the indirect effect of the model can be formally assessed using a Sobel test which tests the joint significance of the b and c paths shown in Figure 4. Strength and significance of direct and indirect effects were evaluated by examining the significance (at .05 *p*-level) of the Z-test of estimate. The significance level was drawn from the unit normal distribution of a two-tailed Z-test and assumption that mediated effect equals zero. See Figure 1 for the Model 1.

It was also predicted that families of low-income socioeconomic status may be less responsive to CBC (Lundahl et al, 2006; Reyno & McGrath, 2006; Webster-Stratton, 1990; Werba et al., 2006). Researchers in the area of family interventions have reported significant difference in treatment response between families of various income levels. Therefore, low-income socioeconomic status of a family was evaluated as a covariate of Model 1.

*Research questions 4 and 5.* A second aim of the current study was to evaluate the extent to which two dimensions of home intervention implementation integrity (i.e., adherence and full engagement) mediated the relationship between parenting stress and change in child problem behavior for families involved in CBC (see Figures 2 and 3). Parenting stress served as the predictor variable in the multilevel structures. See previous section for more information regarding the parent stress variable.

The mediator variables in both Models 2a and 2b were dimensions of home intervention implementation integrity. In Model 2a, parent report of adherence to the



behavioral intervention served as a mediator and in Model 2b, parent report of full engagement in the intervention implementation phase served as the mediator. These home intervention implementation integrity variables were assessed within the CBC intervention group participating in the “CBC in the Early Grades” study. Adherence to home behavioral intervention was operationalized as the average percentage of plan steps completed (across both measures of integrity) as designed in consultation. Full engagement in the intervention implementation phase was defined as the average percentage of steps the family documented as complete or incomplete and submitted to graduate assistants (across both measures of integrity).

Change in child problem behavior in the home setting served as a criterion variable in this analysis. Results from the PDR yielded a frequency score of problem behaviors reported by the caregiver for each observation. Observations pre-treatment were averaged and observations post-treatment were averaged. The two average scores were then used in computing the change scores. PDR change scores across time were used in the current study. Further information regarding these variables was provided above.

Both Model 2a and Model 2b were examined using multilevel path analysis. It is important to note that only the members of the CBC intervention group were included in the analyses because only the families who received CBC implemented a behavioral intervention at home. Home intervention implementation integrity dimensions were represented as percentages and change in child problem behavior was represented by a change score (see above). The analysis consisted of multiple steps. Direct effects, mediator effects, teacher/classroom effects and overall model fit were evaluated. First,

direct effects between variables were evaluated. Direct effects evaluated included: (a) parenting stress on change in child problem behavior, (b) parenting stress on adherence to behavioral interventions, (c) parenting stress on full engagement in the intervention implementation phase, (d) adherence to behavioral interventions on change in child problem behavior at home, and (e) full engagement in the intervention implementation phase on change in child problem behavior.

Next, among members of the CBC intervention group, the extent to which adherence to home behavioral interventions and full engagement in the intervention implementation phase mediated parenting stress and change in child problem behavior were examined. The mediator roles of the integrity dimensions (i.e., adherence and engagement) in each model were tested using a Sobel test. According to MacKinnon and Dwyer (1993) and MacKinnon, Warsi, and Dwyer (1995) mediation occurs when the independent variable affects the dependent variable indirectly by first affecting the mediator which then affects the dependent variable. Thus, in order for mediation to occur parenting stress must significantly predict change in child problem behavior and the relationship between parenting stress and change in child problem behavior must significantly decrease upon addition of the mediator (i.e., one of two integrity dimensions) to the model. Mediation can be formally assessed using a Sobel test which tests the joint significance of the b and c paths shown in Figures 5 and 6. Strength and significance of direct and indirect effects were evaluated by examining the significance (at .05 *p*-level) of the Z-test of estimate. The significance level was drawn from the unit normal distribution of a two-tailed Z-test and assumption that mediated effect equals zero. Figure 2 and 3 for Models 2a and 2b.

*Research question 6.* The multilevel structural model accounted for anticipated classroom effects or variance attributable to level-2 (classrooms/teachers). The students/parents were nested within classrooms and as a result, students within the same classrooms will have correlated scores. These correlations must be represented in the analysis in order to draw valid conclusion from the data. As a result, a multilevel framework was used. Multilevel modeling allowed regression coefficients to vary between groups; intercepts were allowed to vary to account for variation in the intercepts attributable to classrooms. The multilevel model included two levels, level-1 (students and parents) and level-2 (classrooms/teachers).

The classroom/teacher nesting effect was evaluated by a chi-square difference test. The chi-square difference or deviance test involved nested modeled comparisons. The fact that the fixed effects were the same across a series of compared nested models justified the use of the chi-square difference tests for the teacher-level variances. Therefore, for all 3 models (Model 1, 2a and 2b), nested models were compared to measure the variance accounted for by classroom assignment. For instance, one model with the teacher-level variance on the mediator variable restricted to zero was compared to a model without the teacher-level variance on the mediator restricted to zero. Results were evaluated at two-tailed .05 *p*-levels of significance. If the chi-square statistic of the model including the teacher-level variance was significantly different than the statistic without the teacher-level variance, the teacher-level significantly accounted for variance in the model and therefore remained. Non-significant chi-square values indicated that the model did not fit significantly worse when the teacher-level variance for outcome or mediator variables was removed.

## CHAPTER 4

### Results

This study examined three models with the purpose of understanding influential variables on children's outcomes during CBC while accounting for the assumed effect of classrooms and teachers. Descriptive statistics and multilevel modeling results are presented below. Each model was tested separately and results are described in the following section.

#### *Descriptive Statistics*

The assumptions of regression were assessed prior to the multilevel analyses. Regression assumes data are normally distributed, there is a linear relationship between the independent and dependent variables, variables are measured without error (reliable) and data are homoscedastic (variance of errors is the same across all levels of the independent variable). Conditions of linearity and homoscedasticity were examined. Descriptive statistics were computed for each variable to assess for normality. Absolute skewness to standard error ratio and kurtosis to standard error ratio values greater than two were considered problematic. See Table 4 for a listing of each measure's descriptive statistics.

Table 4

*Descriptive Statistics of Constructs and Measures in Control and Intervention Groups*

Construct and Measure	N	Min	Max	Mean	SD	Skew	Kurtosis
Control Group (N=92)							
Baseline Parenting Stress							
The Parenting Stress Index (PSI) <sup>a</sup>	58	1.25	3.08	2.14	.433	-.144	-.658
Change in Positive Parenting Practices							
Alabama Parenting Questionnaire: Positive parenting and involvement subscales (APQ) <sup>b</sup>	42	-.56	.56	-.003	.272	.090	.554
Change in Child Problem Behavior							
Parent Daily Report (PDR) <sup>c</sup>	61	-6.55	7.33	-1.06	2.68	.541	.703
CBC Intervention Group (N= 111)							
Baseline Parenting Stress							
The Parenting Stress Index (PSI) <sup>a</sup>	67	1.15	3.11	2.08	.469	.383	-.394
Change in Positive Parenting Practices							
Alabama Parenting Questionnaire: Positive parenting and involvement subscales (APQ) <sup>b</sup>	50	-.75	.94	-.053	.381	-.027	-.362
Change in Child Problem Behavior							
Parent Daily Report (PDR) <sup>c</sup>	70	-9.26	7.00	-2.00	3.15	.279	.609
Adherence to Home Behavioral Intervention							
Self-report and permanent product measures <sup>d</sup>	68 <sup>g</sup>	.00	1.00	.802	.211	-1.43 <sup>e</sup>	-2.38 <sup>e</sup>
Self-report measure only	49 <sup>g</sup>	.00	1.00	.779	.248	-1.59 <sup>e</sup>	2.56 <sup>e</sup>
Permanent product only	53 <sup>g</sup>	.24	1.00	.849	.216	-1.40 <sup>e</sup>	.777 <sup>e</sup>

Construct and Measure	N	Min	Max	Mean	SD	Skew	Kurtosis
CBC Intervention Group (N= 111)							
Full Engagement in Intervention Implementation Phase							
Self-report and permanent product measures <sup>f</sup>	95 <sup>g</sup>	.00	.92	.387	.284	-.166	-1.19
Self-report measure only	95 <sup>g</sup>	.00	1.00	.244	.321	1.16	.120
Permanent product measure only	95 <sup>g</sup>	.00	.93	.279	.300	.476	-1.26

*Note.* <sup>a</sup>PSI scores are average baseline scores of the scale; the possible range of scores is 1 to 5 with 5 indicating high parental stress. <sup>b</sup>APQ scores are change scores based on the difference between the average post-test scores and the average pre-test scores of the positive parenting composite (sum of positive parenting and involvement subscale scores); possible range of raw scores is 1.00 to 5.00. <sup>c</sup>PDR scores are change scores representing the difference between the average PDR post-test scores and the average PDR pre-test scores; the possible range of raw scores is from 0-34. <sup>d</sup>Adherence to home behavioral intervention scores are the average of the two measures' (self-report and permanent product measures) total scores; total scores of each measure were computed by dividing the total number of behavioral plan steps completed by the total number of plan steps, excluding NA responses and data not recorded or returned; the possible range of average scores was 0 to 1.00. <sup>e</sup>Skewness and kurtosis to standard error ratios were squared. The ratios presented are squared transformations. <sup>f</sup>Full engagement to the intervention implementation phase scores are the average of two measures' (self-reports and permanent products) total scores; total scores of each measure were computed by dividing the number of self-monitored plan steps recorded by the total number plan steps possible, excluding NA responses; the possible range of average scores was 0 to 1.00. <sup>g</sup>Number of integrity reports, not number of participants.

*Baseline parenting stress.* Parent's average levels of parenting stress baseline scores were determined using the average raw baseline scores for the PSI. Parents rated each item on a Likert scale ranging from 1 to 5. A rating of 1 indicated parents strongly disagreed with the statement; a rating of 5 indicated parents strongly agreed with the statement. The higher the score, the more stress the parent indicated. On average, parents in the sample reported a low level of parenting stress on the PSI (total sample mean item score = 2.11, control group mean item score= 2.14, CBC intervention group mean item score = 2.08).

*Positive parenting practices.* Change in positive parenting practices was computed as the difference between the positive parenting practices composite pre- and

post-test scores on the APQ. As parents report the use of positive parenting more often, their score on the APQ increases; if a parent reports using positive parenting practices more often post-treatment versus pre-treatment, a positive change score results. The mean positive parenting practices change score for this study's sample was .028 indicating a minimal improvement (approximately .03 positive change on the likert scale) in positive parenting practices over time, with change scores ranging from -.75 to .94. The mean positive parenting practices change score for the CBC intervention group was -.053 suggesting no improvement in positive parenting practices over time when parents participate in CBC, with change scores ranging from -.75 to .94.

*Change in child problem behavior.* Change in child problem behavior at home represented the difference between post- and pre-test average scores of child problem behavior reported by parents on the Parent Daily Report (PDR). Test scores were calculated by summing the number of reported problem behaviors during the pre-treatment and post-treatment phases and then dividing the sum score by the number of reports. Therefore, pre- and post-treatment scores were average scores. Change scores ranged from -9.25 to 7.33 (N=70), indicating families reported changes in problem behavior from a decrease in approximately 9 problem behaviors to an increase in about 7 behaviors. On average, families reported a decrease in 1.56 problem behaviors over time. When families participated in CBC, they reported an average decrease in 2 problem behaviors over time (range = -9.26 to 7.00 behaviors). When families did not participate in CBC, they reported an average decrease in 1.06 problem behaviors (range = -6.55 to 7.33 behaviors).

*Adherence to home behavioral interventions (intervention implementation integrity).* Percent adherence to home behavioral interventions was computed for each of the two measures (i.e., self-report and permanent product) by dividing the number of behavioral plan steps completed by the total number of plan steps. For the 68 cases with adherence to behavioral intervention data, both measures' total adherence scores were averaged to create a mean adherence to intervention score. Results indicated on average 80% of intervention steps were completed by parents as designed across both measures; 78% of steps were reported as complete on self-report forms and 85% of steps were reported as complete on permanent products. Parents implemented interventions with high integrity (i.e., greater than 75% steps completed) in the home. Skewness and kurtosis to standard error ratios revealed adherence to behavioral intervention data were not normally distributed. A square transformation improved the distribution on the adherence scores (skewness= 1.43; kurtosis = -2.38); however, using the transformed variable in place of the original only slightly changed the model. The transformed variable was used in the analyses and is presented in Table 5.

*Full engagement in the intervention implementation phase.* Parent report of full engagement in the intervention implementation phase of CBC (i.e., self-monitoring adherence to intervention steps, recording/documenting completion of steps, and submitting integrity forms for review) was calculated for each measure of integrity (i.e., self-report and permanent product). Parents self-monitored their adherence to intervention steps by indicating if a step was completed, not completed, or not applicable. Full engagement in the intervention implementation phase was defined as the degree to which parents self-monitored or documented their adherence to plan steps; the number of



self-monitored plan steps recorded on the report form was divided by the total number plan steps possible. Self-report and permanent product full engagement scores were averaged to create a full engagement to intervention implementation phase score for each case. The mean full engagement score for the sample was .387 indicating approximately 39% of all possible behavior plan steps were self-monitored, documented and reported. Full engagement scores on each measure were similar; self-report full engagement mean score was .244 and permanent product full engagement mean score was .279. A clear difference between full engagement and adherence scores was evident as parents self-monitored, documented, and reported integrity on only an average 39% of intervention steps, and adhered to an average 80% of intervention criteria. When parents were fully engaged in the intervention implementation phase, they reported a high degree of adherence to behavioral intervention steps; however, only an average of 39% of steps were documented. This result suggested full engagement (i.e., self-monitoring and recording adherence to intervention plans, and submitting integrity forms) may be related to the extent with which parents implement interventions as planned and possibly even an integral piece to increasing adherence to intervention steps.

*Model 1 Specification: Research Questions 1, 2, 3, and 6*

Multilevel path analysis was conducted to account for the clustering of teacher effects and evaluate the relationships between the group (i.e., CBC intervention or control), parenting stress, change in positive parenting practices, and change in child problem behavior at home in Model 1. The direct effects specified in the model included: (a) treatment group on change in child problem behavior, (b) treatment group on change in parenting practices, (c) change in positive parenting practices on change in child

problem behavior, (d) parenting stress on change in positive parenting practices, (e) parenting stress on change in child problem behavior. See Figure 4 for the multilevel model.

Parenting stress was hypothesized to moderate direct effects; change in positive parenting practices was hypothesized to mediate direct effects. Specifically, parenting stress was evaluated as a moderator of the relationship between (a) group and change in child problem behavior, and (b) group and change in positive parenting practices (i.e., research questions 1 and 2). The degree in which change in positive parenting practices partially mediated the relationship between CBC treatment group and change in problem child behavior was also tested (i.e., research question 3). Table 5 presents a listing of the parameter coefficients for the model to indicate the relative strength of the individual predictors and covariates. See Figure 4 for the beta weight coefficients of each pathway in the mediational and moderational model. The paths of significance are represented by a solid line and paths of nonsignificance are represented with a broken line.

*Results of model 1.* Direct effects were tested in the multilevel model. A significant negative relationship between treatment group and change in child problem behavior was indicated in the model ( $\beta = -0.228$ ; small direct effect). Thus, when families participated in the CBC treatment group (CBC group scored as 1, control group scored as 0; higher score is supportive of CBC effects) they reported more reductions in their children's problem behaviors over time (i.e., negative scores are equal to decrease in problem behaviors). More specifically, families participating in CBC reported a decrease in 1.3 behaviors above and beyond control groups. A significant negative relationship was also indicated between change in positive parenting practices and parenting stress ( $\beta$

= -0.2; small direct effect). As parents reported more parenting stress, they reported less positive change (i.e., increase in use over time) in their positive parenting practices. For example, as parenting stress scores increased by 1 unit, parents reported 0.153 less change in positive parenting practices on the APQ subscales. Stress appears to predict a parent's ability to develop and strengthen positive parenting practices. All other direct effects were nonsignificant.

No significant interaction effects were evident. Thus, parental stress did not moderate (a) the relationship between treatment and change in child problem behavior, or (b) the relationship between treatment and change in positive parenting practices. A Sobel test was conducted to test for indirect effects and results were nonsignificant, indicating no significant indirect relationships (Sobel = -0.439,  $p = 0.661$ ). When indirect effects are not present in a model, mediating effects are undetectable. Thus, change in parenting practices did not partially mediate the relationship between CBC treatment and change in child problem behavior.

In order to see if differences among teachers/classrooms significantly affected the results, teacher effects (i.e., nesting by classrooms) were removed from the model. This model was then compared with the original model considering the teacher effects using chi-square difference analyses. The nonsignificant chi-square values indicated the model does not fit significantly worse when the teacher-level variance for change in child problem behavior and change in positive parenting practices were removed from the model ( $\chi^2(2) = 0.535, p > .05$ ). Therefore, in Model 1, differences among teachers/classrooms did not significantly affect results.

*Covariates.* Demographic variables were considered as possible covariates in the model. Specifically, low income socioeconomic status was examined as a possible covariate in the model; however, it did not affect change in child problem behavior or change in positive parenting strategies. The model is not affected by accounting for low-income socioeconomic status ( $z = 0.35, p > .05$ ). All families in the CBC treatment group and control group, regardless of socioeconomic status, appear to report positive changes in their children's behavior over time. In Table 5, indices are presented to indicate the relative strength of the covariate.

Additionally, to account for the problems associated with using change scores (i.e., change in parenting practices and change in child problem behavior), baseline scores were tested as covariates. Problems with change scores include (a) change scores tend to be less reliable because more error is factored in, (b) pre-test scores and change scores tend to be correlated and therefore it is hard to determine accurate change, and (c) scores tend to regress towards the mean over time resulting in a more liberal measure of change. A regression of the change scores on the baseline scores was computed to account for these problems. Adding the baseline scores as covariates did not change any direct or indirect effects. The baseline scores were significantly related to the change scores; higher baseline scores were associated with lower change scores (see Table 5). However, including the baseline scores as covariates only changed the model fit slightly. When children exhibited more problem behavior pre-treatment, their parents reported less positive change in behavior over time.

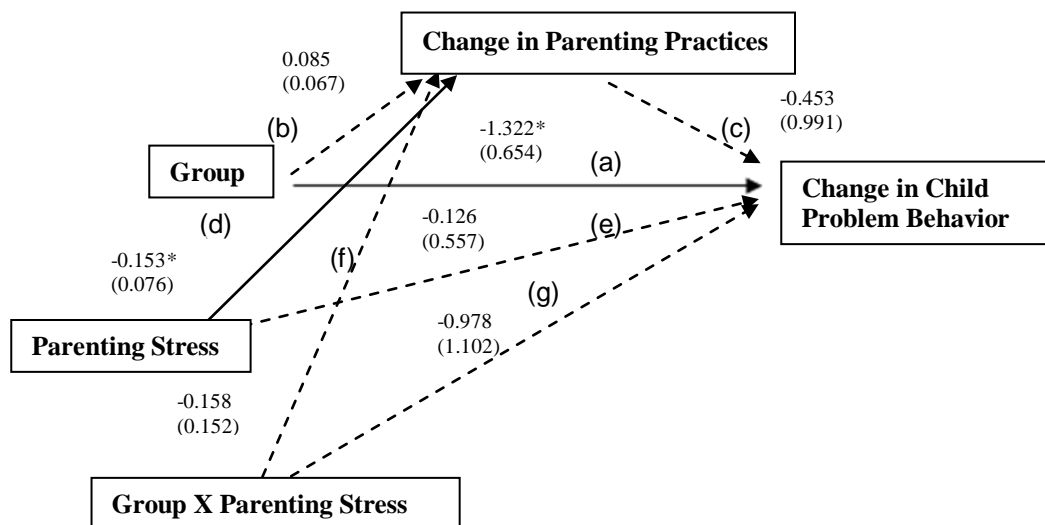
Table 5

*Regression Parameter Coefficients for Model 1*

Effect	B	$\beta$	S. E.	B/SE <sup>a</sup>
Treatment group on change in positive parenting practices	0.085	0.121	0.067	1.263
Parenting stress on change in positive parenting practices	-0.153	-0.2	0.076	-2.023*
Treatment group and parenting stress on change in positive parenting practices	-0.158	-0.102	0.152	-1.035
Baseline positive parenting practices score on change in positive parenting practices	-0.33	-0.35	0.091	-3.63**
Change in positive parenting practices on change in child problem behavior	-0.453	-.055	0.991	-0.457
Treatment group on change in child problem behavior	-1.322	-0.228	0.654	-2.02*
Parenting stress on change in child problem behavior	-0.126	-0.02	0.557	-0.226
Treatment group and parenting stress on change in child problem behavior	-0.978	-0.077	1.102	-0.888
Baseline child problem behavior score on change in child problem behavior	-0.245	-0.388	0.065	-3.758**

Note. <sup>a</sup>Evaluated with Z-statistic

\*  $p < .05$ . \*\*  $p < .01$ .



Note. Paths of significance are represented by a solid line (two-tailed test at  $p < .05$ ); paths of nonsignificance are represented by a broken line.

Figure 4. Model 1: Change in Parenting Practices as a Mediator, Parenting Stress as a Moderator

#### Model 2 Specification: Research Questions 4, 5 and 6

Model 2a and 2b were developed after a thorough review of previous theory and research indicating that adherence to a behavioral plan (i.e., intervention implementation integrity) and full engagement in the intervention implementation phase (i.e., self-monitoring adherence to intervention plans, recording completion of intervention steps, and submitting integrity forms for review) mediate environmental factors, such as parenting stress and treatment outcomes (e.g., change in child problem behavior over time; Cordray & Pion, 2006; Durlak, 1998; Dusenbury et al., 2003; Watson et al., 2006). Prior to the analyses, the relationship between parent report of adherence to behavioral intervention and full engagement in the intervention implementation phase was evaluated to ensure each variable was unique. A two-tailed Pearson correlation was conducted.

Adherence to the behavioral intervention was not significantly related to full engagement in the intervention implementation phase, defining each variable as distinctly different from one another ( $r = .020, p > .05$ ). Multilevel modeling tested for direct, indirect, and mediating effects, and accounted for teacher effects in both models. Post-hoc analyses were also conducted after results of analyses were first reviewed. See Table 6 for a listing of the parameter coefficients for the models. Figures 5 and 6 present beta weight coefficients for each pathway. Paths of significance are represented by a solid line and paths of nonsignificance are represented by a broken line.

*Model 2a.* Multilevel path analysis was conducted to test the relationships between parenting stress, adherence to behavior plan, and change in child problem behavior while taking into account teacher-level variance. The direct effects specified in the model included: (a) change in child problem behavior on parenting stress, (b) adherence to behavior plan on parenting stress, and (c) change in child problem behavior on adherence to behavior plan. In Model 2a, adherence to behavioral intervention was hypothesized to mediate direct effects a, b, and c. Intervention adherence was evaluated as a mediator between parenting stress and change in child problem behavior.

A multilevel structural model was analyzed using path analysis. A regression within the model indicated a significant negative relationship ( $\beta = -0.446$ ; medium direct effect). Adherence to the behavioral intervention predicted change in child problem behavior over time. Specifically, as parents who participated in CBC adhered to more predesigned intervention steps, they reported a larger reduction in their child's problem behaviors over time. For instance, for every 1% increase in adherence scores, parents reported an average reduction of approximately 5 problem behaviors. All other analyzed

direct effects were nonsignificant. A Sobel test was conducted to test for indirect effects and results were insignificant for Model 2a (Sobel = -0.152,  $p = 0.88$ ) indicating no significant indirect relationships and therefore no mediator in the model. Adherence to the behavior intervention did not mediate the relationship between parenting stress and change in child problem behavior when families participated in CBC.

Teacher effects (i.e., nesting by classrooms) were tested for by comparing Model 2a-teacher effect included with Model 2a-teacher effect *not* included using a chi-square analysis. The chi-square analysis tested to see if significant amount of variance was due to the clustering at the teacher level. In model 2a, the non-significant chi-square values indicated that the model does not fit significantly worse when the teacher variance for change in child problem behavior and adherence to interventions were removed ( $\chi^2(2) = 0.986, p > .05$ ). Consultant effects were also tested. Consultant effects did not converge for the model because only 7 consultants participated in the study and at least 30 macro-level units are necessary to model effects at that level.

*Model 2b.* Multilevel structural modeling was conducted to test the relationships between parenting stress, full engagement in the intervention implementation phase, and change in child problem behavior while taking into account teacher-level variance. The direct effects specified in the model included: (a) parenting stress on change in child problem behavior, (b) parenting stress on full engagement in the intervention implementation phase and (c) full engagement in the intervention implementation phase on change in child problem behavior. In Model 2b, parent report of full engagement in the intervention implementation phase was evaluated as a mediator between parenting stress and change in child problem behavior.



A multilevel path analysis was analyzed. A regression within the model indicated one significant direct effect, a significant negative correlation between parenting stress and full engagement in the intervention implementation phase ( $\beta = -0.36$ ; medium direct effect). As parenting stress increased, parents self-monitored and recorded the degree to which they adhered to intervention steps less. Specifically, as parenting stress increased by 1 unit on the PSI-SF scale, full engagement scores decreased by 13%. All other analyzed direct effects were nonsignificant. A Sobel test was conducted and results were nonsignificant (Sobel = 1.319,  $p = 0.19$ ) indicating no significant indirect relationships. Therefore, full engagement in the intervention implementation phase did not mediate the relationship between parenting stress and change in child problem behavior when families participated in CBC.

The intraclass correlation (ICC) for the full engagement variable (ICC=0.487) was large enough such that accounting for teacher-level variation in the means of full engagement scores significantly improved model fit; 48% of variance was attributable to teacher-level variance. These results indicated a need for a multilevel model. Teacher effects (i.e., nesting by classrooms) were tested for by comparing the model with and without teacher variance using chi-square analyses. In Model 2b, teacher-level variance was present in the full engagement scores; removing teacher-level variance significantly worsened model fit. Therefore, teacher-level variance in full engagement scores remained in the model. Chi-square difference tests indicated removing the random effect significant worsened model fit ( $\chi^2(1) = 6.195$ ,  $p < .05$ ). Thus, a family's level of engagement in the intervention process depended on the classroom and/or teacher of their child. No teacher effect was found on the parent report of problem behavior change scores. The

nonsignificant chi-square difference test value indicated the model fit did not significantly worsen when the teacher-level variance for child problem behavior was removed. Change in child problem behavior over time does not appear to be affected by the child's assigned classroom or teacher ( $\chi^2(1) = .036, p > .05$ ). Consultant effects were also tested. Consultant effects did not converge for the model because only 7 consultants participated in the study and at least 30 macro-level units are necessary to model effects at that level.

*Covariate analyses for Models 1, 2a, and 2b.* To account for the problems associated with using change scores (i.e., change in child problem behavior), the Parent Daily Report (PDR) baseline score was tested as a covariate. A regression of the change scores on the baseline scores was computed. Adding the baseline score as covariates did not change a single decision, direct or indirect, and only changed the model fit slightly. The baseline scores were significantly related to the change scores, in that higher baseline scores were associated with lower change scores. Children whose parents reported more child problem behaviors at home before interventions indicated less positive change in their children's behavior during CBC. In Table 6, indices are presented to indicate the relative strength of the covariates.

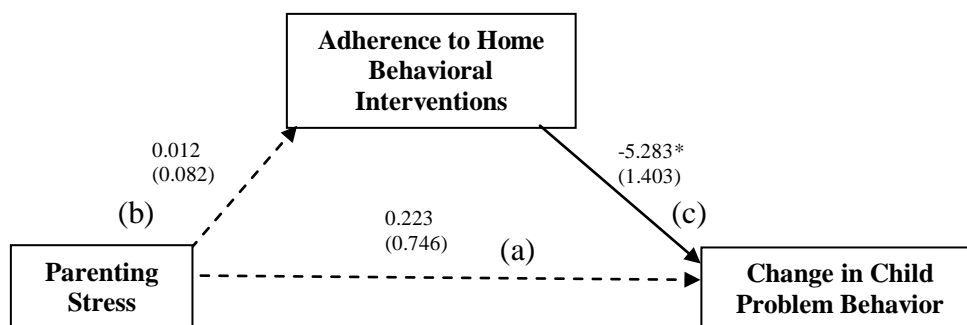
Table 6

*Regression Coefficients for Mediational Models 2a and 2b*

Effect	B	$\beta$	S. E	B/SE <sup>a</sup>
Model 2a: Adherence as Mediator				
Parenting stress on adherence to behavioral intervention	0.012	0.023	0.082	0.151
Adherence to behavioral intervention on change in child problem behavior	-5.283	-0.446	1.403	-3.767**
Parenting stress on change in child problem behavior	0.223	0.034	0.746	0.299
Positive parenting practices baseline scores on change in positive parenting practices	-0.412	-0.54	0.062	-6.595**
Model 2b: Full Engagement as Mediator				
Parenting stress on full engagement in the intervention implementation phase	-0.131	-0.36	0.05	-2.616**
Full engagement in the intervention implementation phase on change in child problem behavior	-4.423	-0.245	2.568	-1.722
Parenting stress on change in child problem behavior	-0.977	-0.157	0.633	-1.542
Child problem behavior baseline scores on change in child problem behavior	-0.245	-0.388	0.065	-3.758**

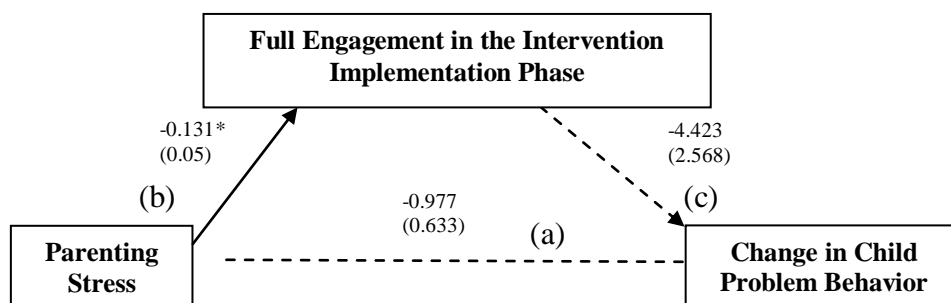
Note. <sup>a</sup>Evaluated with Z-statistic

\*  $p < .05$ . \*\*  $p < .01$ .



*Note.* Paths of significance are represented by a solid line; paths of nonsignificance are represented by a broken line.

*Figure 5.* Model 2a: Adherence to Home Behavioral Interventions as a Mediator with Beta Weights



*Note.* Paths of significance are represented by a solid line; paths of nonsignificance are represented by a broken line.

*Figure 6.* Model 2b: Full Engagement in the Intervention Implementation Phase as a Mediator with Beta Weights

## CHAPTER 5

### Discussion

The purpose of this study was multi-faceted. One purpose was to understand the mediating and moderating effect of specific family variables (i.e., parenting stress and positive parenting practices) on change in children's problem behaviors at home. Second, this study aimed to understand the impact of parenting stress on the relationship between CBC and the change in positive parenting practices over time. The third purpose was to evaluate two forms of treatment integrity (i.e., adherence and full engagement in the intervention implementation phase) as possible mediators of parenting stress and change in child problem behavior at home. The study also aimed to understand teacher/classroom effects. Specifically, the author sought to understand the influence of parenting stress on families' abilities to implement behavioral interventions with adherence and fully engage in the intervention implementation phase, and understand the influence of adherence and full engagement on CBC's treatment effect on change in child problem behavior at home. An additional aim of the study was to introduce a multimethod approach to measuring treatment integrity of home interventions.

#### *Summary of Findings and Integration of Findings with Past Literature*

The significance of each finding will be discussed in the following section (See Table 7 for a summary of findings). Findings for the multilevel models will be presented. Model 1, the role of parenting stress as a moderator and positive parenting strategies as a mediator of CBC effects will be presented first. This will be followed by Model 2a, adherence to behavioral intervention as a mediator and subsequently Model 2b, full engagement in the intervention implementation phase as a mediator. Significant direct

effects of treatment group (Model 1) and adherence to behavioral interventions (Model 2a) on change in child problem behavior at home, and the significant direct effect of parenting stress on parent's full engagement in the intervention implementation phase (Model 2b) will be discussed.

Table 7  
*Summary of Findings*

Type of Effect	Result	Link to Research
Research Questions: Model 1		
	1) Does parenting stress moderate the relationship between conjoint behavioral consultation and change in child problem behavior at home?	
	2) Does parenting stress moderate the relationship between conjoint behavioral consultation and change in positive parenting practices (i.e., parental involvement and positive parenting)?	
	3) Does change in positive parenting practices (i.e., parental involvement and positive parenting) partially mediate the relationship between conjoint behavioral consultation and change in problem behavior at home?	
	6) Does the classroom/teacher significantly affect each model?	
Direct Effect	When parents participated in CBC they reported positive child behavior change at home.	Consistent with previous research, but tested within large experimental design
Direct Effect	When parents reported more stress, they indicated a reduction in the frequency with which they use positive parenting techniques.	Consistent with previous research
Moderation	Parenting stress did not moderate the relationship between CBC and home treatment outcomes (i.e., change in positive parenting practices and change in child problem behavior).	Novel finding

Type of Effect	Result	Link to Research
Mediation	Change in positive parenting practices did not mediate the relationship between CBC and change in child problem behavior.	Novel finding
Covariate	Families of low-income socioeconomic status did not respond in a distinctly different way to CBC.	Consistent with previous research, but tested within large experimental design
Teacher Effect	Teacher/classroom effects were not present in the model.	Novel finding

#### Research Questions: Model 2a

4) Does adherence to behavioral interventions at home mediate the relationship between parenting stress and change in child problem behavior at home?

6) Does the classroom/teacher significantly affect each model?

Direct Effect	As parents implemented home interventions with more adherence, they reported more reductions in child problem behavior at home.	Consistent with previous research
Mediation	Adherence to behavioral interventions at home did not mediate the relationship between parenting stress and change in child problem behavior.	Novel finding
Teacher Effect	Teacher/classroom effects were not present in the model.	Novel finding



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Research Questions: Model 2b

5) Does full engagement in the intervention implementation phase of CBC mediate the relationship between parenting stress and change in child problem behavior at home?

6) Does the classroom/teacher significantly affect each model?

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Direct Effect	As parenting stress increased, parent's report of full engagement in the intervention implementation phase decreased as evident by parents self-monitoring and documenting adherence less and submitting integrity forms less.	Novel finding
Mediation	Full engagement in the intervention implementation phase of CBC did not mediate the relationship between parenting stress and change in child problem behavior at home.	Novel finding
Teacher Effect	Parent's report of full engagement in the intervention implementation phase depended partly on their child's classroom assignment.	Novel finding

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*Direct and indirect effects in Model 1.* Treatment group (i.e., CBC or control group) had a significant direct effect on change in child problem behavior at home. A significant negative relationship was found between treatment group and change in child problem behavior at home. This finding indicated families who participated in CBC reported their children exhibited fewer problem behaviors at home during the intervention phase of CBC. Thus, CBC appears to be effective at decreasing child problem behaviors at home over time.

CBC has been previously shown to be effective at reducing child problem behavior and improving adaptive skills at home (Colton & Sheridan, 1998; Guli, 2005; Illsley & Sladeczek, 2001; Kratochwill et al., 2003). The majority of research supporting the treatment effects of CBC with children who exhibit behavior problems used small-n designs. Only one study (Kratochwill et al., 2003) has examined the effect of CBC on children's social and behavioral skills by conducting various analyses within an experimental design. Goal attainment scales indicated children met their behavioral goals at home, even though large group analyses did not indicate significant improvements in behavior. These findings may be due to the control group including only 21 children. The larger study (i.e., "CBC in the Early Grades Project," Sheridan & Glover, IES grant # R305F050284) is examining the effectiveness of CBC using an experimentally controlled method with a pre-screened sample of children with behavior problems. The current study, which used data from the larger study, is one of the first to support CBC's efficacy in the home setting using an experimentally controlled method and multilevel modeling.

Multilevel modeling techniques also indicated no significant mediator or moderator roles in Model 1, suggesting family context variables (i.e., parenting stress and

positive parenting practices) did not impact the relationship between treatment group and change in child problem behavior. No prior studies have examined the influence of parenting stress and positive parenting practices on CBC outcomes in the home with school-age children who exhibit behavior problems. However, studies examining the effectiveness of other family-oriented interventions, such as behavioral parent training, have shown parenting stress and parenting practices to significantly influence treatment outcomes (Beauchaine et al., 2005; Lundahl et al., 2006; Reyno & McGrath, 2006; Webster-Stratton, 1990; Werba et al., 2006). These findings imply CBC may be uniquely different from other family interventions. CBC may include treatment components which negate the effects of parenting stress and parenting practices, such as providing family support within the families' natural environments. For instance, CBC consultants use effective communication strategies such as active listening and reflective statements to provide emotional support (Sheridan & Kratochwill, 2008). In addition, consultants coach parents in positive parenting techniques by observing, modeling, and providing performance feedback within the home. These findings also suggest that other mediators and moderators of CBC outcomes may exist and should be included in the model. Further research is needed to understand which, if any family variables impact the effectiveness of CBC.

A second significant direct effect resulted in Model 1. A significant negative relationship was present between change in positive parenting practices and parenting stress. As parents reported more stress, they indicated a reduction in the frequency with which they use positive parenting techniques. This finding supports previous research finding that general stress is associated with poor parenting (Patterson, 1982; Suarez &

Baker, 1997) and expands literature by directly linking stress due to parenting and the use of positive parenting techniques.

It was predicted that families of low-income socioeconomic status may be less responsive to CBC (Lundahl et al, 2006; Reyno & McGrath, 2006; Webster-Stratton, 1990; Werba et al., 2006). Therefore, low-income socioeconomic status was examined as a covariate in the model. Results indicated families of low-income socioeconomic status did not respond in a distinctly different way to CBC, suggesting CBC is effective with families of diverse backgrounds. This finding supports one previous study which examined the effectiveness of CBC with children with and without diversity characteristics (i.e., ethnicity, socioeconomic status, family composition, maternal education level, and language spoken at home) and found evidence to suggest CBC is effective with children with and without diversity characteristics (Sheridan et al., 2006). One reason for this finding may be the individualized nature of CBC which allows for consultants to be culturally (used broadly) sensitive and family-centered throughout the entire CBC process. Future investigations are needed to understand other influential variables on CBC outcomes.

As previously stated, CBC appears to be uniquely different from other family-oriented interventions. One distinct goal of CBC is to join families and schools in the intervention process through an indirect service delivery model. Families and school professionals work concurrently towards a shared goal of child success by implementing consistent and similar interventions in both home and school settings. Given the home-school partnership focus of CBC, it was predicted that children in different classrooms may respond to the CBC process in a distinctive way. This study was a preliminary

attempt to expand research on family interventions and behavioral consultation by testing for environmental effects using multilevel analyses. The multilevel model accounted for teacher-level variance of the change in child problem behavior and mediator variable. Results indicated the model did not fit significantly worse when accounting for nesting by classrooms, suggesting that when families are part of CBC their children's positive changes at home are not due to their assigned classroom/teacher or a carryover effect of positive treatment effects at school, but possibly due to the families full engagement in the CBC intervention implementation phase and dedication to implementing the home behavioral interventions with adherence. The first steps to understanding and testing this hypothesis were completed in Models 2a and 2b.

*Direct and indirect effects in Models 2a.* One significant direct effect was found in Model 2a; adherence to the home behavioral intervention steps significantly predicted change in child problem behavior at home when families participated in CBC. Specifically, a significant negative relationship was evident between adherence to behavioral interventions and change in child problem behavior. That is, as parents implemented home interventions with more adherence (i.e., completed steps as designed in consultation), they reported more reductions in child problem behavior at home. For every one unit increase in parent adherence to intervention at home, child problem behavior at home decreased by 5 behaviors. This finding supports previous research which indicated a direct relationship between adherence to intervention plans and child outcomes during consultation. However, the majority of past studies used small-n research designs and investigated the relationship between adherence to school intervention plans and behavior in the school setting (Gresham, 1989; McDougal et al.,

2005; Noell, 2008; Witt et al., 1997). This study is the first to investigate the relationship between adherence to interventions in the home and child home behavior in the context of CBC. The results emphasize the importance of adherence to home behavioral plans in changing child behavior at home. Clinicians cannot expect positive treatment effects from school interventions to always generalize to the home setting without parents implementing similar interventions with adherence at home.

The indirect effect in Model 2a was nonsignificant suggesting no mediation within the model. Adherence to home intervention plans did not mediate parenting stress and change in child problem behavior. Results suggested parenting stress does not affect the extent with which parents implement interventions as planned or child behavior. This finding may be due to the unique sample of parents; low-stress and skilled parents. In addition, measures of stress and adherence may not have been sensitive. Previous research indicated stress, such as parenting stress, was significantly related to treatment outcomes (Kazdin & Wassell, 1999; Lundahl et al., 2006; Webster-Stratton & Hammond, 1990; Werba et al., 2006), and adherence to treatment plans (Levensky & O'Donohue, 2006; Mellins et al., 2004). The current study did not confirm these results indicating a continued need to further understand the variables that predict adherence to treatment plans developed in consultation and which, if any “events of the real world” influence adherence to intervention plans and consultation outcomes (Cordray & Pion, 2006; Dusenbury et al., 2003; Noell, 2008).

*Direct and indirect effects in Models 2b.* A significant direct effect between parenting stress and full engagement in the intervention implementation phase was evident in Model 2b. A negative relationship existed between full engagement in the

intervention implementation phase and parenting stress. As parenting stress increased, parents' full engagement in the intervention implementation phase decreased as evident by parents self-monitoring less often, and documenting less adherence to intervention steps. If a parent was not fully engaged as defined by this study, they did not self-monitor and record their adherence to the intervention and submit the integrity measures (i.e., adherence was only possible once a parent was engaged). On average, 86% of parents in the CBC treatment group self-monitored, provided evidence of adherence on permanent products, and recorded adherence to 39% of all possible plan steps across 4 weeks of both self-report forms and permanent product report measures. Future studies need to use alternative, meaningful methods of measuring treatment integrity that do not require parents to self-monitor and record integrity data, especially in families who experience parenting stress. For example, video recordings or direct observations of home intervention implementation may be alternative methods of measuring integrity within the home setting. This finding is important because it suggests parenting stress affects how much parents fully engage in the intervention implementation phase. It may be important for practitioners to focus on reducing parent stress to impact parent's engagement in the intervention implementation phase of CBC and ultimately affect adherence to interventions within CBC.

Parent's report of full engagement in the intervention implementation phase did not mediate the relationship between parenting stress and change in child problem behavior when families participated in CBC. Parenting stress did not appear to predict change in child problem behavior during CBC, confirming some previous literature reporting stress is unrelated to outcomes (Hartman et al., 2003; Hemphill & Littlefield,

2006; Webster-Stratton, 1992). Because this direct effect was nonsignificant and no indirect effect was present in the model, mediation was impossible. This study is one of the few to measure alternative dimensions of integrity like full engagement in the intervention implementation phase (i.e., the degree with which parents self-monitored and recorded adherence to intervention steps and submitted integrity forms for review) and the first to investigate the relationship between stress, full engagement during the plan implementation phase, and child behavior outcomes in a CBC context. It remains unclear what role full engagement and other measures of integrity play in the potential relationships between family factors and consultation outcomes. Further exploration is needed to fully understand the characteristics of the home environment that predict consultation outcomes and the role of various forms of treatment integrity.

Interestingly, when teacher effects were accounted for in Model 2b, the teacher-level variable accounted for a significant amount of variance in full engagement in the intervention implementation phase. This effect was not present in Model 2a's measure of integrity (i.e., adherence). Also, no teacher effect was found on change in child problem behavior reports in Model 2b. These findings indicated parent full engagement in the intervention implementation phase depended partly on their child's classroom assignment. Parent's report of full engagement in the intervention implementation phase may be influenced by other parents at the consultation group meetings and their child's teacher; a group effect may be present. For example, when parents and their children's teacher meet in a group to learn intervention plans and evaluate interventions, the group may overtly or covertly influence a parent to record adherence to intervention plans and return the forms for discussion in the CBC group meetings. Groups can covertly



influence other group members when members are motivated by the desire to please or impress other group members (i.e., social desirability) by following the consultant's instructions to self-monitor adherence to the intervention steps. Group members, including certain teachers, may also overtly influence other participants by explaining how recording adherence will help them understand intervention effects and remember plan steps.

#### *Link to Existing Theory*

Findings provided further evidence to support both ecological and behavioral theories. These same theories were used to develop the study's hypotheses. Significant results indicated support for both theories which will be described and linked to the results in this section.

General psychosocial theories support the notion that as a child observes, interacts with, and responds to his/her home environment, he/she learns and develops a behavioral repertoire. Ecological theory emphasizes the important role of multiple systems and the interactions occurring within and between systems on children's development and behavior (Bronfenbrenner, 1977). This theory suggests that children who exhibit behavior problems developed these behaviors by interacting with persons in their environments. For example, in a home environment children interact with caregivers and develop and behave based on these interactions. In a hostile home environment, a child may observe others exhibit disruptive and aggressive behavior, which he/she then learns and replicates. These behavior problems increase in intensity and frequency if they are reinforced by the environment, as explained by behavioral theory. Behavioral theory highlights that a child's behavior is learned by environmental contingencies and altered

by consistent changes to these contingencies. If a behavior is reinforced by the environment, it increases and if a behavior is punished, it decreases. Thus, if a child's misbehavior is consistently reinforced and not punished, the child will continue to exhibit behavior problems over time. To summarize, children learn behavior problems by interacting with others, observing and replicating behavior, and by being reinforced for displaying behavior problems.

General and specific theories highlight the role environment plays in the development of child behavior problems. Behavioral theory emphasizes if maladaptive behaviors are modeled and reinforced and not punished, children are most likely going to develop and display behavior problems. This notion is also supported by a specific behavioral theory, Patterson's theory of coercion (Patterson, 1982) which conceptualizes behavior problems as being developed in the home through maladaptive interactions with family members. Patterson's theory is supported by research that suggests parenting style and skills and the parent-child relationship play a pertinent role in child's development (Johnston & Mash, 2001; Patterson et al., 1992; Shelton et al., 1996; Webster-Stratton & Herbert, 1994).

*The role of parenting.* Results of Models 1 and 2a supported both ecological and behavioral theories by suggesting parents' behavior (e.g., parenting practices and implementing behavioral interventions with adherence) affects their children. Specifically, results indicated a significant relationship between CBC and change in child behavior at home. Thus, if a parent of a child with behavior problems participates in CBC, a service delivery model that aims to build positive parenting skills, teach behavioral intervention strategies, and strengthen relationships within and between

systems, their child's behavior problems will decrease. CBC is a consultation model based on ecological and behavioral theory and this study supports the effectiveness of such a model to improve child behavior in the home.

The role of the implementation of behavioral interventions developed in consultation has not been well researched. Model 2a results provided evidence suggesting parents must adhere to the behavioral interventions to alter their child's behavior at home. This finding strongly supports behavioral theory and ecological theory. It is not enough to include parents in consultation meetings; parents must practice what they learn in the meetings at home.

*The role of stress.* Parenting stress was significantly related to change in positive parenting practices and full engagement in the intervention implementation phase in Models 1 and 2b implying a parent's internal experience influences how he/she parents and how much he/she engages in behavioral interventions. In Model 1, a significant relationship between parenting stress and change in parenting practices was present. In Model 2a, parenting stress was also related to a parent's ability to fully engage in the CBC intervention implementation phase. Full engagement was evident by self-monitoring and recording adherence to intervention steps and submitting integrity forms. As parents reported more parenting stress, they reported less adherence to intervention plans. Parents were either implementing the intervention without self-monitoring and recording adherence, or they were not implementing the intervention and thus had nothing to record. These results support ecological and behavioral theories by confirming the influential role environment plays on not only children's behavior, but parents' behavior. If a parent is experiencing stress from parenting, their ability to learn parenting

practices and behavioral interventions, use positive parenting practices, and adhere to behavioral interventions at home may be negatively influenced. Behavioral theory might highlight that when a parent feels stress from parenting, the internal experience of stress “punishes” a parent for parenting; thus, reducing a parent’s tolerance of behavior problems (McPherson et al., 2009), use positive parenting practices, and engagement in behavioral intervention implementation. In sum, a stressful environment negatively impacts both parents and children.

### *Limitations*

This study contributes to extant literature by presenting support for the effectiveness of CBC at reducing child behavior problems within the home and providing information about the effects of (a) parenting stress on change in parenting practices and full engagement in the intervention implementation phase, (b) adherence to behavioral interventions on child behavior during the CBC process, and (c) teacher-level effects on full engagement of parents in the intervention implementation phase. Even with these contributions, limitations should be considered. Limitations regarding internal and external validity, statistical power, and measurement will be discussed.

*Design and internal validity.* Mediators and moderators were not present in any of the three models. In Model 1, other variables that were not accounted for in this model or perhaps measured in this study may moderate or mediate treatment outcomes. The significant relationship between parenting stress and change in child problem behavior in Model 1 suggests family context variables are related to each other; however, it is still unclear how family context variables impact CBC outcomes. In addition, in Models 2a and 2b with families participating in CBC, the relationship between parenting stress and

child outcomes was nonsignificant. Family context variables related to child outcomes during CBC are still unfounded. Future investigations need to continue to explore relationships between family context and CBC outcomes in order to better understand which families respond best to CBC and how or why CBC is effective.

In Model 2a and 2b, the adherence and full engagement variables were skewed and/or kurtotic, even after squared transformation. When variables are not normally distributed, the assumptions of regression, the basic statistical procedure of a multilevel model, are not met. If assumptions are not met, internal validity is threatened and reduced. Thus, it is difficult to infer the true relationships between the variables in Models 2a and 2b. Other combinations of variables may explain the role of adherence and full engagement in the relationship between family context and child outcomes when families participate in CBC and need to be further explored. Furthermore, the study was not designed to achieve variability in the two measurements of treatment integrity. In fact, the study aimed to maximize integrity as evident by ceiling effects of adherence scores. Future research is needed to examine treatment intervention implementation integrity at various levels with sufficient variability.

*External validity and generalizability.* This study involved a unique sample of parents and children, limiting generalizability of the study. In Model 1, parents reported they were using a moderate amount of positive parenting practices before CBC and reported little to no change in parenting practices over time. Parents appeared to be moderately skilled in their parenting prior to and during CBC. Additionally, parents reported experiencing little parenting stress. Therefore, a unique sample of positive, skilled, and mildly stressed parents were used in the study, leaving little room for

improvement in parenting practices and for reduction in stress. The “normal” levels of parenting stress and moderate use of positive parenting practices may also be a result of the child sample exhibiting less severe amounts of disruptive behavior (i.e., only 23% of child sample were previously diagnosed with a disruptive behavior disorder) than a clinical sample. If the children exhibit less or less severe behavior problems, the parents may be less stressed and more skilled or vice versa.

The child sample is also unique because teachers referred children to CBC services who exhibited a high frequency of externalizing behaviors, severe behavior problems, and who could benefit from additional services at school. Parents did not refer their children to CBC services. It is possible the children did not express as many behavior problems at home as at school, or parents did not view the behaviors as troubling as did teachers. If a child did not have as many or as severe of problems in the home setting, parents may have been less motivated to fully participate or engage in CBC. Parents may have been more interested in their children improving their behavior at school. For example, parents may have been less engaged in the CBC intervention implementation phase (as evident by 39% of plan steps recorded) because they did not see a need for behavioral intervention in the home. In sum, the referral process may explain parents’ low level of full engagement in the intervention implementation phase. Future research should continue to explore the effects of CBC in the home environment with a sample of children who are referred by their caregivers and include a measure of parent motivation.

*Analyses and statistical power.* The sample size met the requirements of the power analysis; however, certain variables were missing large amounts of data. For

instance, adherence to the intervention process was only calculated for 61% of the CBC sample because 38% of parents participating in CBC did not record adherence on integrity forms. Additionally, models 2a and 2b (integrity dimensions as mediators) only included the treatment group sample, which was approximately 45% of the original sample. In future investigations, it is imperative that researchers collect more data on adherence to the intervention using alternative means to better understand adherence of families who did not self-report their follow-through of behavioral intervention implementation. Investigators may consider using other methods of measurement, such as direct observations. Furthermore, some measures were only collected during two years of the study and therefore less data were available for those variables (e.g., parenting stress and parenting practices and child problem behavior). These problems of nonignorable missingness, attrition, non-responders, and lack of data lead to problems with validity of statistical results. Replication of this study with data collected from a larger percentage of the sample may yield more significant effects.

Various consultants facilitated CBC with families; however, it was not possible to account for a consultant effect on results. Consultant years of experience, specific previous experiences, education level, knowledge, style, or ability to conduct CBC with integrity may impact treatment outcomes. Future investigations may aim to understand the effect a consultant has on CBC effects.

*Measurement.* One of the greatest limitations to be considered is the use of parent self-report data to measure each variable. Self-report data is limited given its potential for bias. Parental stress, parenting practices, parent adherence to behavioral interventions, and full engagement in the intervention implementation phase were skewed, possibly due

to parent's biased report of their own stress level, use of positive parenting, and follow-through with implementing behavioral interventions. Measures also may have been insensitive and unable to capture information to clearly represent the constructs. It is suggested that future investigations measure parenting behavior by using a multimodal measurement approach that includes an independent observer of parent behavior or videotaped behavior which can be coded by independent coders.

This study extended previous literature on treatment integrity by introducing novel and multiple methods of measuring integrity within a consultation framework. Measures of intervention implementation integrity used in the current paper have been used previously, but evidence of their psychometric properties is limited (Sheridan et al., in press). Standardized measures of intervention implementation integrity need to be developed and psychometric properties of treatment integrity measures of adherence and full engagement must be evaluated. Furthermore, the treatment integrity estimates presented in the study did not include data from parents who did not return self-report forms and permanent products. Therefore, integrity estimates may inflate the adherence to intervention score. Lastly, results indicated higher adherence and full engagement scores on permanent product measures indicating parents may prefer using permanent products. Permanent products are a feasible and useful way of measuring treatment integrity because families naturally use the products as they implement interventions (Sanetti & Kratochwill, 2008). Additionally, the high integrity levels reported on permanent products may suggest that parents are not over-reporting on self-report measures. Researchers should continue to enhance permanent product measures to



capture intervention elements and investigate the psychometric properties of this preferred method of measurement.

### *Future Research Directions*

Future research should continue to inquire about influential variables on CBC treatment outcomes. Consultation research related to identifying and testing mediators and moderators models of treatment effects is limited. Specifically, little is known about the relationships between family contextual variables, behavioral intervention implementation integrity, and consultation outcomes. Furthermore, little research has focused on measuring and evaluating treatment integrity of behavioral interventions developed in behavioral consultation, especially in the home setting. Mediating and moderating roles must be examined to better understand the operative features of indirect model of services like consultation, including how, why, and for whom treatment is effective.

*Future general research directions.* In general, consultation researchers can expand current literature by continuing to explore contextual factors that may impact various CBC outcomes. The environmental context that children, families, and teachers experience impact them, suggesting a need for studies which examine the impact of classrooms, schools, neighborhoods, and homes. Future studies can use multilevel modeling to explore the possible impacts of such contexts or systems on individuals, groups, and treatment outcomes. Additionally, CBC most likely affects not only child behavior, but parent behavior, teacher behavior, and the parent-teacher-child relationship (Guli, 2005; Sheridan & Kratochwill, 2008). These findings have yet to be replicated using experimentally controlled, group designs. Future researchers can use such methods

to further understand the broad impact of CBC. Moreover, specific environmental factors in the home and school setting which influence how families, schools, and children respond to CBC can be explored in the future.

*Future integrity research directions.* Few studies have investigated the role of treatment integrity in consultation research. The author of this study aimed to lay the groundwork for the development of a theory of intervention integrity within consultation. Future research can build upon this study and strive towards a larger goal of developing a theory of how integrity impacts consultation effects.

In developing a theory of integrity, researchers should continue to aim towards defining integrity terms, strengthening assessment procedures, and creating systematic methods of integrity evaluation. First, *specific dimensions of intervention implementation integrity within consultation must be defined*. Five dimensions of treatment integrity have been identified: adherence, dosage, quality of program/intervention delivery, participant responsiveness and program differentiation (Dusenbury et al., 2003; O'Donnell, 2008). However, these dimensions are rarely measured, nor are their impact explored in consultation research. Adherence, the more frequently measured dimension in consultation research, is conceptualized as the implementation of intervention strategies as designed. The current study measured and explored the effects of adherence to interventions designed in consultation while also defining a sixth dimension, full engagement in the intervention implementation phase. Full engagement in the intervention implementation phase was defined as the degree with which consultees self-monitored and recorded adherence, and submitted integrity measures for review. Future studies can continue to define intervention implementation integrity within a consultation

framework in novel, meaningful ways, to measure multiple dimensions of integrity above and beyond adherence.

Second, it is imperative to *strengthen assessment procedures* by identifying critical components of interventions, collecting data through a multi-method, multi-informant approach, and examining the psychometric properties of measures (McGrew, Bond, Dietzen, & Salyers, 1994; Moncher & Prinz, 1991; Teague, Bond, & Drake, 1998). Researchers can collect information about integrity dimensions by not only self-report and permanent product methods, but through enhanced permanent products and independent observations. In the current study, the researchers could not expect adherence without full engagement because adherence was measured by self-report and permanent products which required parents to self-monitor and self-record their adherence to the intervention and submit the two integrity measures for review (i.e., full engagement). When parents engaged in the intervention implementation phase (i.e., self-monitored and recorded adherence and submitted integrity forms), parents reported higher levels of adherence to intervention steps (80% steps completed) and even higher levels of adherence when recording on permanent product measures. Meaningful permanent products that measure more elements of interventions may yield to higher levels of engagement. Furthermore, future research needs to measure adherence as an independent construct by conducting independent observations of in-vivo intervention implementation. When assessment techniques are developed, their psychometric properties (i.e., reliability and validity) need to be examined. Consultation research has yet to develop psychometrically sound measures of intervention implementation integrity dimensions.

Finally, once researchers understand methods to measure various components of integrity in a systematic and standardized manner, *the unique role of integrity in consultation* can be experimentally examined. This study and others have specified the importance of integrity, specifically adherence to interventions, on child behavior during behavioral consultation (Gresham, 1989; Noell, 2008); however, replication of this finding in the home and school setting is needed and the possible mediational role of intervention implementation integrity warrants further investigation. For example, by designing an investigation to examine integrity at different levels, intervention implementation integrity can be examined as a mediator of consultation treatment outcomes. Furthermore, the impact of environmental variables on integrity has yet to be investigated. The current study found that parenting stress significantly predicted full engagement in the intervention implementation phase. This preliminary finding points to a need for further research on predictors of intervention implementation integrity. Once predictors of integrity are specified, consultants and consultees can work to alter children's' environments so they are best suited to maximize integrity.

#### *Implications for Practice*

Study findings have implications for many professionals who facilitate indirect service delivery, such as consultation. This includes but is not limited to educators, school mental health professionals, and other service providers trained in consultation. The results provide support for the use of an indirect school-family partnership model (i.e., CBC). When school mental health professionals facilitate CBC with families and schools they hope to see effects beyond the classroom. In fact, this study illustrated partnering with families in treatment led to reduced child behavior problems at home.

The results of this study provided evidence for the effectiveness of CBC at reducing child problem behavior within their homes; family-based interventions directly affected their child's behavior at home. Specifically, these results hold true with the sample used in the study (i.e., parents who use positive parenting practices and experience little parenting stress and children who seem at-risk for disruptive behavior disorders, but do not exhibit clinical levels of impairment). Moreover, CBC appears to be effective at reducing behavior problems at home with families of varying socioeconomic levels; income does not appear to affect outcomes. These findings imply CBC may be a method of prevention to be used with mildly stressed, skilled parents whose children exhibit behavior problems, but have not been diagnosed with a disruptive behavior disorder. Practitioners (e.g., school professionals) who can implement prevention/intervention programs will most likely see successful results with this model. It is unknown if CBC can be effective as a treatment model for children with clinically significant levels of behavior problems and/or a psychiatric diagnosis whose families live with extreme life stress and use negative or hostile parenting practices.

Another important consideration for professionals facilitating CBC is that of maximizing adherence to behavioral interventions. Results suggested that as parents adhere to the intervention plans more faithfully, they report fewer child problem behaviors at home over time. This result highlighted the important role of consultants in supporting families to maximize adherence to intervention plans. Consultants can provide support throughout the intervention implementation phase by following a family-centered model of practice, modeling intervention implementation within the home, communicating frequently about adherence to the intervention plan, and providing

performance feedback directly to the consultee (Swanger-Gagné, Garbacz, & Sheridan, in press). Moreover, increasing full engagement in the intervention implementation phase (i.e., self-monitoring of adherence to plan steps and self-recording adherence to each step) may increase adherence to the intervention. In this study, families who reported the degree to which they adhered to intervention protocols reported adhering to 80% of plan steps, suggesting full engagement is important for adherence. Professionals may need to develop reinforcement systems to increase full engagement during phases of treatment implementation. To effectively support families, it may be helpful for mental health professionals to assume the role as family collaborator as a way to empower families to meet such expectations of intervention adherence.

Consultants might also find it important to support families by helping them relieve parenting stress. Results of this study suggested parenting stress is related to changes in parenting practices and full engagement in the intervention implementation phase. Families experiencing more parenting stress reported fewer increases in the use of positive parenting practices over time and less engagement in the intervention implementation phase (i.e., they documented adherence to intervention plans less). Parenting stress seems to affect a parent's ability to fully participate in and benefit from CBC. Thus, professionals may have to provide additional support to motivate, engage, and reinforce the parents' participation and use of positive parenting. Additionally, consultants may need to make an effort to reduce parenting stress by providing emotional support and teaching stress management.

Lastly, results indicated parents' full engagement in the intervention implementation phase is related to the classroom to which a child is assigned. The

teacher/classroom effect on family full engagement suggests family-school partnership models lead to effects that cross settings. Teachers and possibly other parents of children within the same classroom who are involved in CBC impact parent behavior.

Practitioners within schools can use a family-school partnership approach to service delivery in attempt to foster relationships and opportunities for communication across settings. This approach may indirectly engage parents in behavioral intervention implementation.

### *Conclusion*

This study began as an investigation to identify influential family contextual variables on CBC treatment outcomes at home. The purpose expanded to not only explore the role of family context variables, but also understand the specific role of intervention implementation integrity of home interventions using a multimodal, multidimensional approach to measurement. Results of multiple regressions within a multilevel model supported (a) CBC effectiveness at reducing child behavior problems at home, (b) a negative correlation between parenting stress and change in positive parenting practices, (c) a relationship between adherence to interventions and change in child problem behavior at home, and (d) a negative correlation between parenting stress and full engagement in the intervention implementation phase. The models resulted in significant direct effects; however, indirect, moderating, and mediating effects were nonsignificant. These results suggest parenting stress and positive parenting practices do not mediate or moderate CBC treatment outcomes at home and neither dimension of intervention integrity mediate parenting stress and change in child problem behavior at home when families participate in CBC.

Other variables and levels were examined in the multilevel models, including low-income socioeconomic status and a teacher/classroom effect. When low-income socioeconomic status was accounted for in Model 1, no significant amount of variance was accounted for implying no significant relationship between low-income status and outcomes. When the level of the classroom was accounted for in all models, it was only significantly related to full engagement in the intervention implementation phase. These results imply other influential variables that were not measured or examined in this study may also impact CBC outcomes.

Even with these interesting findings, conclusions from this study must be made with caution in light of possible limitations. A unique sample of children referred by teachers, not parents, was used in the study. The referral process may have impacted parent participation and full engagement in CBC during the plan implementation phase. Also, the child sample was not a clinical sample, but a sample of children experiencing behavior problems at school with parents who on average reported mild levels of parenting stress and frequent use of positive parenting practices. These parents are most likely different from parents who have children diagnosed with disruptive behavior disorders. The sample impedes generalizability of results and calls for replication of the study with various samples. In addition, measures of integrity (i.e., adherence and full engagement) were skewed and/or kurtotic which may have influenced internal validity. Possibly the largest limitation was the fact that all variables were assessed using self-report measures, suggesting response bias in the reports. These factors may have influenced the results of the study and limit the study's implications.



This study contributed to behavioral consultation and family intervention literature by exploring influential variables on CBC outcomes using a controlled experimental design. Of utmost interest were the influential roles of family context and family adherence to home interventions. The study contributed to the literature base by laying the foundation for a line of research focused on understanding for whom, why, and how CBC is effective in home settings. Models of analyses were hypothesized and future research can build upon these beginning findings to develop theories and models which explain how and why family context and family intervention integrity impact consultation outcomes.

One unique expansion to the literature worthy of additional attention is this study's method of measuring and exploring the role of treatment integrity within consultation. This was the first study to measure intervention integrity within CBC using a two dimensional and multimodal approach, exploring the role of adherence to intervention plans and full engagement in the intervention implementation phase through self-report and permanent product measures. This preliminary attempt to systematically measure integrity may allow future researchers to further develop a standardized, systematic method of measuring intervention implementation integrity within consultation. Additionally, this study was one of the first attempts to understand the relationships between family context variables, intervention implementation integrity, and CBC outcomes. Furthermore, home intervention integrity was measured and its impact on child outcomes in the home examined. Results contributed to a literature base of studies mainly focused on measuring and examining integrity in the school setting.

A long line of research provides evidence for the effectiveness of behavioral consultation and family interventions with children who exhibit behavior problems. Unlike one family intervention, behavioral parent training, the influential variables on consultation outcomes are unknown. Consultants do not know for whom consultation is effective or factors in the home environment that impact treatment effectiveness. If this information was known, consultation could focus not only on procedural goals, but also on impacting the family system at various levels affecting outcomes. Furthermore, researchers, educators, mental health providers, and other professionals working with families and children who exhibit behavior problems can strengthen indirect service delivery by developing knowledge on influential variables and building evidence-based models that support caregivers throughout intervention delivery. These models can then be disseminated through large scale programming and public policy to promote successful outcomes of children at-risk for disruptive behavior, conduct problems, and possibly other dire outcomes.

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## Appendix A Screening Tool

### Severity Rating Scale

## ADDITIONAL SEVERITY RATING SCALE

Teacher Name\_\_\_\_\_

School Name\_\_\_\_\_

**Externalizing** refers to all behavior problems that are directed outwardly, by the child, toward the external social environment. Externalizing behavior problems usually involve behavioral excesses, (i.e., too much behavior) and are considered inappropriate by teachers and other school personnel. **Non-examples** of externalizing behavior problems would include all forms of adaptive child behavior that are considered appropriate to the school setting.

**Examples include:**

- displaying aggression toward objects or persons,
- arguing,
- forcing the submission of others,
- defying the teacher,
- being out of seat,
- not complying with teacher instructions or directives,
- stealing,
- not following teacher or school imposed rules.
- having tantrums,
- being hyperactive and
- disturbing others

**Non-Examples include:**

- cooperating, sharing
- working on assigned tasks
- making assistance needs known in an appropriate manner,
- listening to the teacher,
- interacting in an appropriate manner with peers
- complying with teacher requests
- following directions and
- attending to task

Please rate the following three items for only the top 5 students with consent you identified from your class as exhibiting externalizing behavior to the greatest degree. Please rate **all 5** of these students, even those who do not exhibit highly challenging behaviors.

Student Name\_\_\_\_\_

## 1. The severity of externalizing behaviors.

<u>Very Mild</u>		Somewhat <u>Mild</u>		<u>Moderate</u>	Somewhat <u>Severe</u>		<u>Very Severe</u>	
1	2	3	4	5	6	7	8	9

## 2. The frequency of externalizing behaviors.

Very <u>Infrequent</u>		Somewhat <u>Infrequent</u>		<u>Moderate</u>	Somewhat <u>Frequent</u>		<u>Very Frequent</u>	
1	2	3	4	5	6	7	8	9

## 3. The need for additional intervention.

<u>No Need</u>		<u>Moderate Need</u>		Significant <u>Need</u>
1	2	3	4	5

Appendix B  
Intervention Implementation Integrity Forms

Integrity Self-Report Plan Summary Form  
Permanent Product Sample  
Permanent Product Report Form  
Permanent Product Reliability Form

## Conjoint Behavioral Consultation in the Early Grades Plan Summary Form Completed by \_\_\_\_\_

Jay

Home \_\_\_\_\_ School \_\_\_\_\_ X \_\_\_\_\_ Date: \_\_\_\_\_

Y = Yes (the step was completed as planned)Ab = Absent child or absent adult (out of room, on vacation, weekend, change in schedule, illness etc.)NCC = Step not completed by **child** (the child did not perform required behavior, e.g. the child did not meet goal or the child did not display inappropriate behavior)NCA = Step not performed or completed by **adult** (child was present but adult did not observe the child or did not complete the step completely or accurately)**Plan Steps:**

	M	T	W	R	F	S	Sun
1. Removed a token from child when he showed inappropriate behavior (interrupting)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
2. Child met goal (3 tokens kept)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
3. Gave child identified reward (smiley face on goal sheet/goal sheet cash in at the end of the day)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
4. Complete home-school note (goal sheet)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
5. Sent note with child (home/school)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
6. Checked note	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
*Turn in these items to the consultant:							



# Jay's Home-School Note

Date: \_\_\_\_\_

Jay's goal = Jay will have three tokens left for not interrupting during Math and follow directions at home 70% of the time during Bedtime.

Goal met at school?

M \_\_\_\_ T \_\_\_\_ W \_\_\_\_ Th \_\_\_\_ Friday \_\_\_\_

Mrs. P 's comments:

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---



---

Goal met at home?

M \_\_\_\_ T \_\_\_\_ W \_\_\_\_ Th \_\_\_\_ Friday \_\_\_\_

Parent's comments:

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---



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Initials

M \_\_\_\_ T \_\_\_\_ W \_\_\_\_ Th \_\_\_\_ F \_\_\_\_



Consultant Permanent Product Report Completed By \_\_\_\_\_

## Conjoint Behavioral Consultation in the Early Grades

Jay

Home \_\_\_\_\_ School X Date: \_\_\_\_\_Y = Yes (the step was completed as planned)Ab = Absent child or absent adult (out of room, on vacation, weekend, change in schedule, illness etc.)NCC = Step not completed by **child** (the child did not perform required behavior, e.g. the child did not meet goal or the child did not display inappropriate behavior)NCA = Step not performed or completed by **adult** (child was present but adult did not observe the child or did not complete the step completely or accurately)

## Plan Steps:

	M	T	W	R	F	S	Sun
1. Removed a token from child when he showed inappropriate behavior (interrupting)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
2. Child met goal (3 tokens kept)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
3. Gave child identified reward (smiley face on goal sheet/goal sheet cash in at the end of the day)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
4. Complete home-school note (goal sheet)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
5. Sent note with child (home/school)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
6. Checked note	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
*Turn in these items to the consultant:							

Permanent Product Reliability Report Completed By \_\_\_\_\_

## Conjoint Behavioral Consultation in the Early Grades

Jay

Home \_\_\_\_\_ School   X   Date: \_\_\_\_\_

Y = Yes (the step was completed as planned)

Ab = Absent child or absent adult (out of room, on vacation, weekend, change in schedule, illness etc.)

NCC = Step not completed by **child** (the child did not perform required behavior, e.g. the child did not meet goal or the child did not display inappropriate behavior)

NCA = Step not performed or completed by **adult** (child was present but adult did not observe the child or did not complete the step completely or accurately)

### Plan Steps:

	M	T	W	R	F	S	Sun
1. Removed a token from child when he showed inappropriate behavior (interrupting)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
2. Child met goal (3 tokens kept)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
3. Gave child identified reward (smiley face on goal sheet/goal sheet cash in at the end of the day)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
4. Complete home-school note (goal sheet)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
5. Sent note with child (home/school)	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
6. Checked note	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA	Y Ab NCC NCA
9. Turn in these items to the consultant:							

Appendix C  
Mplus Multilevel Path Analysis Syntax

Model 1 Mplus Syntax  
Model 2a Mplus Syntax  
Model 2b Mplus Syntax

```

TITLE:  Model 1 Analysis
DATA:   FILE is reduced.dat;
        FORMAT is 31f8.2,3f8.0;
VARIABLE:  NAMES are int_p,int_ppc,
int_tot,doc_p,doc_ppc,doc_mean,int_doc,
pdr_pre,pdr_post,pdr_chng,psi_pd,psi_pdpo,
psi_pre,psi_post,psi_chng,
apq_ipre,apq_ipos,apq_pppr,apq_pppo,apq_popr,
apq_popo,apq_ic,apq_ppc,apq_pc,psi,group,gr_psi,
psi_pdmc,gr_psid,psi_doc,psi_int,tid,cid,lowinc;

        USEVARIABLES are pdr_chng,group,psi,gr_psi,
        apq_pc ,pdr_pre,tid,apq_popr,lowinc;

        CLUSTER IS tid;
        WITHIN = group,psi,gr_psi,
        pdr_pre,lowinc;

        BETWEEN = ;
        MISSING = all(-99);

ANALYSIS:  TYPE is twolevel missing h1;
MODEL:

        %WITHIN%
        apq_pc ON group,psi,gr_psi,apq_popr,lowinc;
        pdr_chng ON apq_pc;
        pdr_chng ON group,psi,gr_psi,lowinc;
        pdr_chng ON pdr_pre;

        %BETWEEN%
        pdr_chng@0; apq_pc@0;

MODEL INDIRECT:
        pdr_chng IND apq_pc, group;

OUTPUT:    STAND;

```

```

TITLE:  Model 2a Analysis
DATA:   FILE is reduced.dat;
        FORMAT is 31f8.2,3f8.0,2f8.2;
VARIABLE:  NAMES are int_p,int_ppc,
int_tot,doc_p,doc_ppc,doc_mean,int_doc,
pdr_pre,pdr_post,pdr_chng,psi_pd,psi_pdpo,
psi_pre,psi_post,psi_chng,
apq_ipre,apq_ipos,apq_pppr,apq_pppo,apq_popr,
apq_popo,apq_ic,apq_ppc,apq_pc,psi,group,gr_psi,
psi_pdmc,gr_psid,psi_doc,psi_int,tid,cid,lowinc,
int2,psi_int2;

        USEVARIABLES are pdr_chng,psi,int2,
        pdr_pre;
        USEOBSERVATIONS IS group EQ .5;
        CLUSTER IS tid;
        WITHIN = psi,pdr_pre;

        !BETWEEN = ;
        MISSING = all(-99);

ANALYSIS:  TYPE is twolevel missing h1;
MODEL:
        %WITHIN%
        !pdr_chng,psi,int_tot,pdr_pre;
        int2 ON psi;
        pdr_chng ON int2,psi,pdr_pre;

        %BETWEEN%
        pdr_chng@0; int2@0;

MODEL INDIRECT:
        pdr_chng IND int2, psi;

OUTPUT:    STAND;
           TECH1;

```

```

TITLE:  Model 2b Analysis
DATA:   FILE is reduced.dat;
        FORMAT is 31f8.2,3f8.0,2f8.2;
VARIABLE:  NAMES are int_p,int_ppc,
int_tot,doc_p,doc_ppc,doc_mean,int_doc,
pdr_pre,pdr_post,pdr_chng,psi_pd,psi_pdpo,
psi_pre,psi_post,psi_chng,
apq_ipre,apq_ipos,apq_pppr,apq_pppo,apq_popr,
apq_popo,apq_ic,apq_ppc,apq_pc,psi,group,gr_psi,
psi_pdmc,gr_psid,psi_doc,psi_int,tid,cid,lowinc,
int2,psi_int2;

        USEVARIABLES are pdr_chng,psi,doc_mean,
        pdr_pre;
        USEOBSERVATIONS IS group EQ .5;
        CLUSTER IS tid;
        WITHIN = psi,pdr_pre;

        !BETWEEN = ;
        MISSING = all(-99);

ANALYSIS:  TYPE is twolevel missing h1;
MODEL:

        %WITHIN%
        !pdr_chng,psi,int_tot,pdr_pre;
        doc_mean ON psi;
        pdr_chng ON doc_mean,psi,pdr_pre;

        %BETWEEN%
        pdr_chng@0;

MODEL INDIRECT:
        pdr_chng IND doc_mean, psi;

OUTPUT:   STAND;
        TECH
1;

```